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Projekt Schneller Brüter

MITRA – A Program for the Transformation of the Output of MIGROS-2 into an Input for GRUMA

H. Huschke, B. Krieg

GESELLSCHAFT
FÜR
KERNFORSCHUNG M.B.H.

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H.Huschke

B.Krieg

Gesellschaft für Kernforschung mbH., Karlsruhe

Abstract

In this report the computer program representing the connection between the program system MIGROS-2 and the GRUBA management program GRUMA is described. The program MITRA tests the consistence of the output of MIGROS-2 which is written on an external storage unit and transforms this output into an input for the GRUBA management program GRUMA. MITRA is written in FORTRAN IV with the exception of one small ASSEMBLER routine and is presupposing the GRUBA library as used in Karlsruhe.

MITRA - Ein Programm zur Umwandlung der Ausgabe von MIGROS-2 in eine Eingabe für GRUMA

Zusammenfassung

In diesem Bericht wird das Computerprogramm beschrieben, das die Verbindung zwischen dem Programmsystem MIGROS-2 und dem GRUBA Managementprogramm GRUMA darstellt. Das Programm MITRA prüft die Konsistenz der Ausgabe von MIGROS-2, die auf einer externen Speichereinheit abgelegt ist und überführt diese Ausgabe in eine Eingabe für das GRUBA Managementprogramm GRUMA. MITRA ist in FORTRAN IV geschrieben und enthält einen kleinen Programmteil in ASSEMBLER. MITRA setzt die in Karlsruhe benutzte Form der GRUBA-Bibliothek voraus.

Contents

Introduction

It is the purpose of the program MITRA to transform the output of MIGRØS-2, /1/ , in that way, that it can be used as input for the GRUBA-management program GRUMA /2/. Various group constants can be calculated in MIGRØS-2 by different methods. The program MITRA allows the selection of those data, which should be brought on the data library GRUBA /2/, /3/, which forms the basis for the calculation of macroscopic group constants.
The program MITRA allows furthermore some formal checks of the MIGRØS-2 output. It is also possible to produce a printout of the data, which shall be brought on GRUBA and of those, which might be replaced on GRUBA.
A MITRA-run presupposes a MIGRØS-2 output, as described in /1/, and an opened GRUBA-file, as described in /2/. MITRA is written in FORTRAN IV language for an IBM computer /4/ with the exception of one subroutine which is written in ASSEMBLER.

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1. Description of the program MITRA

The code MITRA consists of the MITRA mainprogram and the following subroutines:
FREEFØ, TEST1, TEST3, TEST5, TEST6, TEST7, TEST9, GRB, DATNAM, DEFI.
Except for the resonance self shielding factors, the data from MIGRØS-2 output are only checked and transformed into an input format for GRUMA, but not changed with regard to the numerical values. The temperature dependent resonance self shielding factors are renormalized in MITRA. This is necessary, because the average group cross sections are not exactly temperature independent in those cases, where the energy group boundaries cut the "wings" of important resonances. If the average group cross sections are only slightly temperature dependent, MITRA renounces of the renormalization in the case that

$$1 - \frac{\sigma^{\infty}_{x,g}(T)}{\sigma^{\infty}_{x,g}(\tilde{T})}$$ is less than or equal to 1.E-5, with $\sigma^{\infty}_{x,g}(T)$:

average group cross section for infinite dilution at the temperature T_l and $\sigma^{\infty}_{x,g}(\tilde{T})$: average group cross section for infinite dilution at the temperature $\tilde{T}$ at which $\sigma^{\infty}_{x,g}(T)$ takes it's greatest value.
It is also possible to prepare unnormalized temperature dependent f-factors for GRUBA in spite of the fact that

$$1 - \frac{\sigma^{\infty}_{x,g}(T)}{\sigma^{\infty}_{x,g}(\tilde{T})}$$ is greater than 1.E-5.

This possibility for several energy groups is controlled by the input, see 2.

If resonance self shielding factors are tabulated on GRUBA for several temperatures, the average group cross section at that

temperature, at which it takes it's greatest value, is stored. All self shielding factors are renormalized to this value, if necessary.

$$\tilde{f}_{x,g}(\sigma_o,T) = \frac{\sigma^{\infty}_{x,g}(T)}{\sigma^{\infty}_{x,g}(\tilde{T})} \cdot f_{x,g}(\sigma_o,T)$$

x: reaction type

g: energy group

$\sigma^{\infty}_{x,g}(T)$: average group cross section for infinite dilution at the temperature T.

$\sigma^{\infty}_{x,g}(\tilde{T})$: average group cross section for infinite dilution at the temperature $\tilde{T}$, at which $\sigma^{\infty}_{x,g}(T)$ takes it's greatest value.

$f_{x,g}(\sigma_o,T)$: resonance self shielding factor for the background cross section σ_o at the temperature T as calculated by MIGRØS-2.

$\tilde{f}_{x,g}(\sigma_o,T)$: renormalized resonance self shielding factor.

The renormalisation is performed for flux- and current-weighted resonance self shielding factors. It must be noted, that if f-factors on GRUBA shall be replaced or completed by new ones, this has to be done simultaneously for all temperatures already available on GRUBA. It may also be done for temperatures not yet available on GRUBA. In the case of temperature dependent resonance self shielding factors, the renormalized f-factors - if renormalization is performed - otherwise the original MIGROS-2 f-factors, in the case of temperature independent resonance self shielding factors calculated from neutron

cross sections, the original MIGROS-2 f-factors are set equal to 1, if the calculated values are in the range between 0.99999 and 1.0001. The reasons are the following ones:

An uncertaining range of $1 \cdot 10^{-5}$ to $1 \cdot 10^{-4}$ seems to be reasonable because the accuracy of the functions ψ, χ used for determining the f-factors in the energy region of resolved resonances is about $1 \cdot 10^{-5}$/5/ whereas the relative accuracy of the tabulated values of the J-function used in the energy range of unresolved resonances may be as low as $1 \cdot 10^{-3}$.
By this mean the possible disturbing influence of minor numerical effects can be eleminated.

The effects of this small modification are:

The storage required on the GRUBA-file becomes smaller because only the f-factors different from unity are stored on the GRUBA-file.
The number of error messages in a MITRA-run due to violation of the conditions that the f-factors in general should be smaller than unity and should monotonously depend on the background cross section σ_o is drastically reduced. Therefore, the number of the necessary corrections using MIKOR is decreased too.

It is possible to prepare f-factors for GRUBA in spite of the fact that the data are not in accordance with the requirements given in TEST1, see 1.1, or TEST3, see 1.2, or if the f-factors are not greater than zero and smaller than or equal to one with the above mentioned correction. This possibility for several self shielding factors in several energy groups is controlled by the input, see 2.

MITRA provides a printout of the GRUMA input records and, if required, a printout of the data which should be replaced on GRUBA belonging to the isotope and data type names and the energy groups given in the MITRA input. For reading the data available

on GRUBA, the subroutines GRB, DATNAM and DEFI are used. They are explained in /2/.

MITRA contains test programs for the following MIGROS-2 modules:

modules 1 and 2	calculating average group cross sections for infinite dilution and energy resonance self shielding factors from resolved or statistical resonance parameters,
module 3	calculating average group cross sections and energy resonance self shielding factors from neutron cross sections given point by point in the energy,
module 5	calculating the zeroth moment of the inelastic scattering from discrete levels and from an evaporation model,
module 6	calculating the zeroth and higher moments of the elastic scattering from angular distributions,
module 7	calculating the fission spectrum,
module 9	calculating the zeroth and higher moments of the elastic scattering for the REMO correction.

For each of these MIGROS-2 modules exists a particular test program which may be used dependent on the MITRA input. If an error is found by these programs, a message is printed out and a control word is set; after the last test program was run the job is terminated. In the following the term "data type name" means either the names of the self shielding factors, or transfer probabilities, or group cross sections etc. which are written in the printout of MIGROS-2 preceding the corresponding data.

1.1 Test of the MIGROS-2 output of the modules 1 and 2

SUBROUTINE TEST1 (MAT,TYP,LAB,FSTAT,MØGRUP,NØUT,FF,LT,NS,MI,
SIGO,T,IREN,TEXT,ATXT,IPS)

In TEST1 the resonance self shielding factors calculated from resolved or from statistical resonances by the MIGROS-2 modules 1 and 2 and eventually renormalized by the MITRA mainprogram are tested. The following checks are performed:

(1) The f-factors must be available for the standard background cross sections 0, 10, 10^2, 10^3, 10^4, 10^5, 10^6.

(2) The f-factors must be greater than zero and less than or equal to one, assuming f = 1 if $0.99999 \lesssim f \lesssim 1.0001$. The reasons for this are described in 1.

(3) The f-factors must increase with increasing σ_o-values.

(4) The f-factors must increase for each σ_o-value with increasing temperatures.

If one of these requirements is violated, a corresponding message is written on the standard output unit 6 and a control word is set indicating the corresponding energy group in which the violation occurs, otherwise TEST1 is terminated successful.

An additional test is performed if the third or the fourth of the above requirements is not fulfilled. In the case the third condition is not fulfilled, it is checked, whether the f-factors are decreasing monotonously with increasing σ_o-values or not.

If yes, the parameters a and b of the following formula are determined and printed for each set of succeeding σ_o-values, i.e. 0, 10; 10, 100; 100, 1000; etc.

$$f(\sigma_o) = \sqrt{\frac{a + \sigma_o}{b + \sigma_o}}$$

In addition the control word is set.
According to the values obtained for a and b it can be judged whether or not the above interpolation formula may be used in GRUCAL /6/ without causing troubles. If it can be used it is possible to annul the call of TEST1 in the mainprogram as explained below.

It not, a message is printed and the control word is set.

If the fourth condition is not fulfilled it is checked whether the f-factors for a certain σ_o-value are decreasing monotonously with increasing temperatures or not.

If yes, the parameters C_o, C_1 and C_2 of the following formula are determined and printed for each of the tabulated σ_o-values

$$f(T) = \frac{C_o + C_1 \sqrt{T}}{C_2 + \sqrt{T}}$$

In addition the control word is set.
According to the values of C_o , C_1 , C_2 it can be judged whether or not the temperature interpolation formula may be used in GRUCAL without causing troubles. If it can be used, it is possible to annul the call of TEST1 in the mainprogram as explained below.

If not, a message is printed and the control word is set.

In certain cases it may be helpful or necessary to disregard the results of TEST1 for the preparation of the GRUMA input. A first run of TEST1 may have shown that f-factors offend against some of the required conditions.

If the additional information provided by TEST1 upon the determination of a,b and of C_o, C_1, C_2 respectively, give confidence that the original data can be used as GRUMA-input although they are not in accordance with the usual requirements, it is possible to annul the function of TEST1. In this case the word ITEST in the third record of the input of MITRA must be set equal to zero. The call statement for TEST1 then is omitted. Furthermore MIKOR allows to modify the original data mainly in order to correct minor deficiencies frequently caused by numerical effects, see 6.

The arguments of TEST1 have the following meaning:

MAT — Word of the length REAL*8 containing the respective isotope name.

TYP — Word of the length REAL*8 containing the name of the respective self shielding factor.

LAB — Word of the length REAL*8 containing the label which precedes the MIGROS-2 output block containing the data type name TYP.

FSTAT(5) — One-dimensional field of the length REAL*8 containing the data type names possible for the MIGROS-2 modules 1 and 2.

MØGRUP — Word of the length INTEGER*4 containing the highest energy group at which MITRA starts.

NØUT — Word of the length INTEGER*4 containing the unit number of the print output of MITRA.

FF(10,100,7) — Three-dimensional field of the length REAL*4 containing the renormalized f-factors for each temperature, energy group and background cross section.

LT — Word of the length INTEGER*4 containing the number of temperatures at which self shielding factors are calculated by MIGROS-2.

NS — Word of the length INTEGER*4 containing the number of background cross sections at which self shielding factors are calculated by MIGROS-2.

MI — Word of the length INTEGER*4 containing the number of energy groups regarded in MITRA.

SIGO (10) — One-dimensional field of the length REAL*4 containing the background cross sections at which the self shielding factors are calculated by MIGROS-2.

T(10) — One-dimensional field of the length REAL*4 containing the temperatures at which the self shielding factors are calculated by MIGROS-2.

IREN(100) — One-dimensional field of the length INTEGER*4. In the case that the self shielding factor in the energy group I shall not be renormalized, IREN (I) is set equal to one in the mainprogram, otherwise IREN (I) is set equal to zero.

TEXT (5) — One-dimensional field of the length REAL*4 containing the text 'NICHT$_b$RENORMIERTEN$_{bb}$'

ATXT (5) — One-dimensional field of the length REAL*4 containing the text '$_{bbbb}$RENORMIERTEN$_{bbbb}$'

IPS(100) — One-dimensional field of the length INTEGER*4. In the case of an error found by TEST1 or by the mainprogram in the data of the I^{th} energy group regarded by MITRA, IPS (I) is set equal to 1. If no error occured, IPS (I) keeps the value zero which was attached by the mainprogram.

1.2 Test of the MIGROS-2 output of the module 3

SUBROUTINE TEST3 (MAT,TYP,LAB,MØGRUP,MUGRUP,ISPA,IGSATZ,MIG,
NØUT,FSTRUK,GSTRUK,FELD,IFELD,LWØRT,KKK)

In TEST3 the temperature independent resonance self shielding factors, calculated from pointwise neutron cross sections by the MIGROS-2 module 3 are tested.
The following checks are performed:

(1) The f-factors must be available for the standard background cross sections 0, 10, 10^2 , 10^3, 10^4, 10^5, 10^6.

(2) The f-factors must be greater than zero and less than or equal to one assuming f = 1 if $0.99999 \leq f \leq 1.0001$. The reasons for this are described in 1.

(3) The f-factors must increase with increasing σ_o-values.

If one of these requirements is violated, a corresponding message is written on the standard output unit 6 and a control word is set indicating the corresponding energy group in which the violation occurs, otherwise TEST3 ist terminated successful.

An additional test is performed if the third of the above requirements is not fulfilled. In this case it is checked wether the f-factors are decreasing monotonously with increasing σ_o-values or not.

If yes, the parameters a and b of the following formula are determined and printed for each set of succeeding σ_o-values, i.e. 0., 10.; 10.,100.; 100.,1000;etc.

$$f(\sigma_o) = \sqrt{\frac{a + \sigma_o}{b + \sigma_o}}$$

In addition the control word is set.

According to the values obtained for a and b it can be judged whether or not the above interpolation formula may be used in GRUCAL /6/ without causing troubles. If it can be used it is possible to annul the call of TEST3 in the mainprogram as explained below.

If not, a message is printed and the control word is set.

In certain cases the results of TEST3 may be disregarded for the preparation of the GRUMA-input. A first run of TEST3 may have shown that f-factors exceeding unity do appear or that the required condition: increasing f-factors with increasing σ_o-values is not fulfilled. If additional informations, e.g. those provided by TEST3 upon the determination of the parameters a and b give confidence that the original data can be used as GRUMA-input although they are not in accordance with the usual requirements, it is possible to annul the function of TEST3. In this case the word ITEST in the third record of the input of MITRA must be set equal to zero. The call statement for TEST3 then is omitted. Furthermore MIKOR allows to modify the original data mainly in order to correct minor deficiencies frequently caused by numerical effects, see 6.

The arguments of TEST3 have the following meaning:

MAT — Word of the length REAL*8 containing the respective isotope name.

TYP — Word of the length REAL*8 containing the name of the respective self shielding factor.

LAB — Word of the length REAL*8 containing the label which precedes the MIGROS-2 output block containing the data type name TYP.

MØGRUP — Word of the length INTEGER*4 containing the highest energy group at which MITRA starts.

MUGRUP — Word of the length INTEGER*4 containing the lowest energy group at which MITRA ends.

ISPA — Word of the length INTEGER*4 containing 0 if the isotope MAT is not fissile or 1 if the isotope MAT is fissile.

IGSATZ — Word of the length INTEGER*4 containing the total number of energy groups as specified in the input of MIGROS-2.

MIG — Word of the length INTEGER*4 containing the unit number of the MIGROS-2 output.

NØUT — Word of the length INTEGER*4 containing the unit number of the print output of MITRA.

FSTRUK (5) — One-dimensional field of the length REAL*8 containing the data type names possible for the MIGROS-2 module 3 for not fissile isotopes.

GSTRUK (6) — One-dimensional field of the length REAL*8 containing the data type names possible for the MIGROS-2 module 3 for fissile isotopes.

FELD (2000) — One-dimensional working field of the length REAL*4.

IFELD (2000) — One-dimensional working field of the length INTEGER*4 which is equivalent to FELD.

LWØRT (2) — One-dimensional working field of the length REAL*8 which is equivalent to FELD.

KKK (500) — Control words of the length INTEGER*4. In the case of an error found by TEST3 in the data of the energy group IG, KKK (IG) is set equal to 1. If no error occured, KKK (IG) keeps the value zero which was attached by the mainprogram.

1.3 Test of the MIGROS-2 output of module 5

SUBROUTINE TEST5 (MAT,LAB,MØGRUP,MUGRUP,MIG,NØUT,FELD,IFELD,
LWØRT,KK)

The purpose of the subroutine TEST5 is to test the zeroth moment of the inelastic scattering. TEST5 adds for each outscattering energy group the inelastic transition probabilities to all in-scattering energy groups. If this sum is not equal to 1 within a permissible error of $\pm 5 \cdot 10^{-4}$, a message is printed out and a control word is set, otherwise TEST5 is terminated successful.

The arguments of TEST5 have the following meaning:

MAT — Word of the length REAL*8 containing the isotope name.

LAB — Word of the length REAL*8 containing the label which precedes the MIGROS-2 output block containing the inelastic transition probabilities.

MØGRUP — Word of the length INTEGER*4 containing the highest energy group at which MITRA starts.

MUGRUP — Word of the length INTEGER*4 containing the lowest energy group at which MITRA ends.

MIG — Word of the length INTEGER*4 containing the unit number of the MIGROS-2 output.

NØUT — Word of the length INTEGER*4 containing the unit number of the print output of MITRA.

FELD (2000) — One-dimensional working field of the length REAL*4.

IFELD(2000) — One-dimensional working field of the length INTEGER*4 which is equivalent to FELD.

LWØRT (2) — One-dimensional working field of the length REAL*8 which is equivalent to FELD.

KK — Control word of the length INTEGER*4. In the case of an error found by TEST5 this word is set equal to 1.

1.4 Test of the MIGROS-2 output of module 6

SUBROUTINE TEST6 (MAT,TYP,LAB,MØGRUP,MUGRUP,MIG,NØUT,FELD, IFELD,LWØRT,KK)

The purpose of the subroutine TEST6 is to test the zeroth moment of the elastic scattering. TEST6 adds for each outscattering energy group the elastic transfer probabilities to all inscattering energy groups. If this sum is not equal to 1 within a permissible error of $\pm 5 \cdot 10^{-4}$, a message is printed out and a control word is set, otherwise TEST6 is terminated successful.

The arguments of TEST6 have the following meaning:

MAT — Word of the length REAL*8 containing the isotope name.

TYP — Word of the length REAL*8 containing the data type name. Only the type SGNCO is valid.

LAB — Word of the length REAL*8 containing the label which precedes the MIGRØS-2 output block containing the elastic transition probabilities.

MØGRUP — Word of the length INTEGER*4 containing the highest energy group at which MITRA starts.

MUGRUP	Word of the length INTEGER*4 containing the lowest energy group at which MITRA ends.
MIG	Word of the length INTEGER*4 containing the unit number of the MIGROS-2 output.
NØUT	Word of the length INTEGER*4 containing the unit number of the print output of MITRA.
FELD (2000)	One-dimensional working field of the length REAL*4
IFELD (2000)	One-dimensional working field of the length INTEGER*4 which is equivalent to FELD.
LWØRT (2)	One-dimensional working field of the length REAL*8 which is equivalent to FELD.
KK	Control word of the length INTEGER*4. In the case of an error found by TEST6 this word is set equal to 1.

1.5 Test of the MIGROS-2 output of module 7

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SUBROUTINE TEST7  (MAT,TYP,LAB,IGSATZ,MIG,NØUT,FELD,IFELD,LWØRT,
                   KK)
```

The purpose of the subroutine TEST7 is to test the fission spectrum. TEST7 adds the values of the fission spectrum for all energy groups. If this sum is not equal to 1 within a permissible error of $\pm 5 \cdot 10^{-4}$, a message is printed out and a control word is set, otherwise TEST7 is terminated successful. If the energy groups of the preceding MIGROS-2 run do not cover the entire energy range relevant to the fission spectrum, TEST7 is terminated with a message without checking the fission spectrum.

The arguments of TEST7 have the following meaning:

MAT	Word of the length REAL*8 containing the respective isotope name.
TYP	Word of the length REAL*8 containing the name of the respective fission spectrum.
LAB	Word of the length REAL*8 containing the label which precedes the MIGROS-2 output block containing the fission spectrum.
IGSATZ	Word of the length INTEGER*4 containing the total number of energy groups as specified in the input of MIGROS-2.
MIG	Word of the length INTEGER*4 containing the unit number of the MIGROS-2 output.
NØUT	Word of the length INTEGER*4 containing the unit number of the print output of MITRA.
FELD (2000)	One-dimensional working field of the length REAL*4.
IFELD (2000)	One-dimensional working field of the length INTEGER*4 which is equivalent to FELD.
LWØRT (2)	One-dimensional working field of the length REAL*8 which is equivalent to FELD.
KK	Control word of the length INTEGER*4. In the case of an error found by TEST7 this word is set equal to 1.

1.6 Test of the MIGROS-2 output of module 9

SUBROUTINE TEST9 (MAT,TYP,LAB,MØGRUP,MUGRUP,MIG,NØUT,FELD,
IFELD,LWØRT,KK)

The purpose of the subroutine TEST9 is to test the zeroth moment of the elastic scattering for the REMO correction.
TEST9 adds for each outscattering energy interval the elastic transfer probabilities to all inscattering energy groups. If this sum is not equal to 1 within a permissible error of $\pm 5 \cdot 10^{-4}$, a message is printed out and a control word is set, otherwise TEST9 is terminated successful.

The arguments of TEST9 have the following meaning:

MAT — Word of the length REAL*8 containing the respective isotope name.

TYP — Word of the length REAL*8 containing the data type name. Only the type SGNCO is valid.

LAB — Word of the length REAL*8 containing the label which precedes the MIGROS-2 output block containing the elastic scattering for REMO correction.

MØGRUP — Word of the length INTEGER*4 containing the highest energy group at which MITRA starts.

MUGRUP — Word of the length INTEGER*4 containing the lowest energy group at which MITRA ends.

MIG — Word of the length INTEGER*4 containing the unit number of the MIGROS-2 output.

NØUT — Word of the length INTEGER*4 containing the unit number of the print output of MITRA.

FELD (2000)	One-dimensional working field of the length REAL*4.
IFELD (2000)	One-dimensional working field of the length INTEGER*4 which is equivalent to FELD.
LWØRT (2)	One-dimensional working field of the length REAL*8 which is equivalent to FELD.
KK	Control word of the length INTEGER*4. In the case of an error found by TEST9, this word is set equal to 1.

2. Description of the input of MITRA

The following comments are necessary for preparing the MITRA input.
Each data record starts in column 1 of a data card. If it is not possible to place all the data of one input record on one card, a second, third,..etc. card may be used, which must have a blank in column 1. Or in other words: a non-blank column 1 in the input card is an indication for a new input record. An alphameric word of the length REAL*8 may be included in apostrophes comprising at least 5 signs and at most 8 signs which are stored left-hand justified in the computer and filled up with blanks if not all 8 bytes are occupied. A special case are REAL*8 alphameric words with a number of occupied bytes less than or equal to 5. These words may be included in ∂-signs. They are also stored left-hand justified in the computer and filled up with blanks. Examples: 'PU239'≡'PU239$_{bbb}$'≡ ∂PU239∂; 'FC$_{bbbbbb}$'≡'FC$_{bbb}$'≡∂FC∂. Fixed point numbers are written in the usual manner, e.g. 1 26 275. The entire input for MITRA is interpreted and written on unit 8 in unformatted form by a FORTRAN IV subroutine FREEFO. MITRA can then read the particular input from unit 8. In the following the input records of MITRA are described.

1. record

ID — Identification word of the GRUBA file in which the MIGROS-2 output shall be inserted (length REAL*8).

IPRO — In the case the data available on GRUBA belonging to the isotope and data type names and the energy groups in this MITRA input shall be printed out,IPRO must be set equal to 1, otherwise 0.

2. record

GMAT — Name of the isotope in GRUBA form (length REAL*8) see /2/ 2.10.

MMAT Name of the same isotope as used in MIGROS-2 (length REAL*8)

ISPA If the isotope is fissile ISPA must be set equal to 1, otherwise 0.

IV To each data type of the MIGROS-2 output belongs one or more processing identification numbers as explained in the GRUBA description /2/. If these numbers are given in the input, IV must be set equal to 1, in the case that the standard numbers of GRUBA are used, IV must be set equal to 0.

3. record

ITYP Number of data types to be inserted in GRUBA for the isotope GMAT, at most 50.

(GTYP(I), MTYP(I),LAB(I),ITEST(I), I = 1,ITYP),NIT, NREN

GTYP: Name of the data type in GRUBA form (length REAL*8),see /2/ 2.10.

MTYP: Name of the same data type as used in MIGROS-2 (length REAL*8), see /1/. This name precedes the respective data in the output of MIGROS-2 .

LAB: Name of the label preceding the MIGROS-2 output block containing the data type MTYP (length REAL*8), see /1/.

ITEST: If the MIGROS-2 output of the respective isotope and data type shall be tested: number of the test subroutine. This number is identical with the number of the MIGROS-2 module having produced this data,
otherwise: 0.

NIT: In the case that one or more elements of the field MTYP describe a self shielding factor with data offending in some energy groups against the requirements given in TEST1 or TEST3, NIT is set equal to the number of names of these self shielding factors. In all other cases NIT must be set equal to zero.

NREN: In the case that one or more elements of the field MTYP describe a temperature dependent self shielding factor with data which shall not be renormalized by MITRA in one or more energy groups even if the greatest value of

$$1 - \frac{\sigma^{\infty}_{x,g}(T)}{\sigma^{\infty}_{x,g}(\tilde{T})}$$

with $\sigma^{\infty}_{x,g}(T)$: average group cross section for infinite dilution at the temperature T and $\sigma^{\infty}_{x,g}(\tilde{T})$: average group cross section for infinite dilution at the temperature $\tilde{T}$ at which $\sigma^{\infty}_{x,g}(T)$ takes it's greatest value, is greater than 1.E-5, NREN is set equal to the number of names of these self shielding factors. In all other cases NREN must be set equal to zero.

Only if IV=1 for each data type:

4. up to ITYP+3.record

J Number of processing identification numbers for the respective data type in the succession as given in GTYP.

(KENNZ(I),I=1,J) Values of the processing identification numbers. In the case of self shielding factors the processing identification numbers must be given in the following succession:

If LAB is set equal to MIGR or FSTAT:

KENNZ(1): Processing identification number for temperature dependent self shielding factors which are not calculated at the standard temperatures $300^{o}K$, $900^{o}K$, $2100^{o}K$, see /2/ 1.3.2.1.2.

KENNZ(2): Processing identification number for temperature dependent self shielding factors calculated at the standard temperatures $300^{o}K$, $900^{o}K$, $2100^{o}K$, see /2/ 1.3.2.1.1.

KENNZ(3): Processing identification number in the case that the self shielding factors for all σ_o-values in one energy group are calculated equal to 1, see /2/ 1.3.2.3.

If LAB is set equal to STRK:

KENNZ(1): Processing identification number for temperature independent self shielding factors with values not equal to 1, see /2/ 1.3.2.1.1.

KENNZ(2): Processing identification number in the case that the self shielding factors for all σ_o-values in one energy group are calculated equal to 1, see /2/ 1.3.2.3.

ITYP+4.record

IOGRUP Highest energy group number on GRUBA being modified by the respective MIGROS-2 output.

IUGRUP Lowest energy group number on GRUBA being modified by the respective MIGROS-2 output.

MOGRUP Highest energy group number in the MIGROS-2 output corresponding to IOGRUP.

MUGRUP Lowest energy group number in the MIGROS-2 output corresponding to IUGRUP.

IGSATZ Total number of energy group boundaries as specified in the input of MIGROS-2. In the case of ABN energy group boundaries IGSATZ has to be set equal to 26.

Only in the case that LAB(I) is set equal to THERM:

ITYP+5.record

NTHERM Number of the thermal energy group on GRUBA.

Only in the case that NIT is set greater than zero follows for each concerned self shielding factor:

ITYP+6.up to ITYP+NIT+5.record

MNAME Name of the self shielding factor as used in MIGROS-2 (length REAL*8).

MLA Name of the label preceding the MIGROS-2 output block containing the data type MNAME (length REAL*8).

K Number of energy groups with data offending against the requirements given in TEST1 and TEST3.

(IOG(J),J=1,K) Energy groups in any succession (at most 20) as used in MIGROS-2.

Only in the case that NREN is set greater than zero follows for each concerned self shielding factor:

ITYP+NIT+6. up to ITYP+NIT+NREN+5.record

RNAME Name of the self shielding factor as used in MIGROS-2 (length REAL*8).

RLA Name of the label preceding the MIGROS-2 output block containing the data type RNAME (length REAL*8).

K Number of energy groups with self shielding factors, which shall not be renormalized.

(IROG(J),J=1,K) Energy groups in any succession (at most 20) as used in MIGROS-2.

This input may be repeated as often as necessary from the second record up to the ITYP+NIT+NREN+5.record. The last input record of MITRA is given by:

∂ENDE∂ ∂ENDE∂ 0 0

DD-cards for a MITRA job

The program MITRA needs DD-cards for the following external storage units:

1 Storage unit containing the GRUBA file.

3 Storage unit containing the external output of MIGROS-2.

8 Storage unit onto FREEFO writes the unformatted input records.

9 Storage unit onto which MITRA writes the external output. This output may be used subsequently as GRUMA input.

3. Description of the output of MITRA

According to the isotopes, data type names and energy groups given in the input, MITRA writes on the external storage unit 9 all transformed MIGROS-2 output data in the form of a GRUMA input as explained in particular in /2/. The general form is:
number of the energy group, name of the isotope, name of the data type, control word, number of data, data.
Moreover MITRA writes on the standard output unit 6 a printout consisting of two parts. The first part is only written if in the MITRA input IPRØ is set equal to 1. In this case the data of GRUBA belonging to the specified isotopes, data types and energy groups are printed in the form as previously explained. The second part is printed independent of the input and contains the transformed MIGROS-2 output representing the output written on unit 9. In the cases of errors or deficiencies detected by MITRA, self explaining error messages are printed on unit 6. In this case the job is terminated and the data set which should be written on unit 9 is empty.

4. Overlay structure and region requirement

If the following overlay structure is used, MITRA needs a storage region of 152 K bytes in the GO-step

```
OVERLAY MITRA
INSERT FREEFO
OVERLAY MITRA
INSERT TEST1
OVERLAY MITRA
INSERT TEST3
OVERLAY MITRA
INSERT TEST5
OVERLAY MITRA
INSERT TEST6
OVERLAY MITRA
INSERT TEST7
```

OVERLAY MITRA

INSERT TEST9

5. Example for a MITRA input

```
'KFKINR  '  1
@U 235@  @U 235@  1  0
4  @FCAPT@  @FG   @  @FSTAT@  2
   @FFISS@  @FF   @  @FSTAT@  2
   @NUE  @  @NUE  @  @SGKE @  0
   @1/V  @  @1/V  @  @S1/V @  0  0  0
14  14  14  14  26
@U 235@  @U 235@  1  0
1  @FELSC@  @FN   @  @MIGR @  1  0  1
18  18  18  18  26
@FN   @  @MIGR @  1  18
@0    @  @0  16@  0  0
1  @FTOT @  @FT1  @  @STRK @  3  0  0
4  4  4  4  26
@0    @  @0  16@  0  0
1  @POETK@  @SGNCO@  @FLUM @  6  0  0
3  3  3  3  26
@ENDE @  @ENDE @  0  0
```

The job-control cards and the MITRA output belonging to this sample problem is given in 9.

6. Description of the program MIKOR

Some of the f-factors calculated by the program MIGROS-2 /1/ may be somewhat erroneous because of numerical effects or other reasons. The program MIKOR allows to replace these erroneous f-factors. The replacement is done for a specific material, a specific temperature, an energy group and a background cross section.

MIKOR presupposes a MIGROS-2 output data set and produces a new data set in the same form as the original MIGROS-2 output but with the exchanged self shielding factors. This MIKOR output can be a meaningful presupposition for a MITRA run.

MIKOR is written in the FORTRAN IV language for an IBM computer /4/. The code MIKOR consists of the MIKOR mainprogram and the subroutine FREEFO.

7. Description of the input of MIKOR

The form of the input data corresponds to the conditions described in 2.

1.record

IGSATZ — Total number of energy groups possible for the chosen energy group set as specified in the input of MIGROS-2. In the case of ABN energy group boundaries IGSATZ has to be set equal to 26.

2.record

LAB — Name of the label preceding the MIGROS-2 output block containing the self shielding factors to be corrected (length REAL*8).

Only in the case that LAB is set equal to MIGR or FSTAT:

3.record

MAT — Name of the isotope as used in MIGROS-2 (length REAL*8).

TEMP — Temperature in [°K] belonging to the f-factors to be corrected.

NG — Number of the energy group belonging to the f-factors to be corrected.

NT — Number of data types, at most 6.

(TYP(I),I=1,NT) — Names of the data types. These names precede the respective data in the output of MIGROS-2.

NSIG Number of background cross sections belonging to the f-factors to be corrected, at most 7.

(SIGO(I),I=1,NSIG) Values of the background cross sections.

((WERT(K,I),K=1,NSIG),I=1,NT) Values of the correct f-factors.

In the case that the values of the correct self shielding factors are constant for one temperature and all standard background cross sections, e.g. 0., 10., 10^2, 10^3, 10^4, 10^5, 10^6, the input may be abridged in the following way:

NSIG = 1
SIGO(1) = 'ALL$_b$'
(WERT(1,1) = value of the self shielding factor for the first temperature.

(WERT(1,2) = value of the self shielding factor for the second temperature.

etc.

Only in the case that LAB is set equal to STRK:

4.record

MAT see 3.record

ISTRUK 0: MAT is a light or medium weight material

1: MAT is a heavy weight material

NG
NT
(TYP(I),I=1,NT)
NSIG
(SIGO(I),I=1,NSIG)
((WERT(K,I),K=1,NSIG),I=1,NT) } see 3.record

This input may be repeated as often as necessary from the second up to the fourth record. The last input record of MIKOR is given by
∂ENDE∂

DD-cards for a MIKOR job

The program MIKOR needs DD-cards for the following external storage units:

3 Storage unit containing the external output of MIGROS-2.

8 Storage unit onto FREEFO writes the unformatted input records.

9 Storage unit onto MIKOR writes the external output. This output may be used subsequently as MITRA input.

8. Description of the output of MIKOR

MIKOR writes on the external output unit 9 a data set in the same form as the original MIGROS-2 external output block /1/ with the self shielding factors corrected as given in the input. Moreover MITRA writes on the standard output unit 6 a printout in the following form:

1.line

Name of the material, number of the energy group

2.line

Background cross section, values of all self shielding factors e.g. the total line of the corrected MIGROS-2 output.

In the cases of errors detected by MIKOR, self explaining error messages are printed on the standard output unit 6. In this case the job is terminated and the data set, which should be written on unit 9, is empty.

9. Sample problem

Job Control Cards

```
JOB ORIGIN FROM LOCAL DEVICE=RD2      ,02C.
//INR017MB  JOB  (0017,101,P6M1B),KRIEG,CLASS=A,REGION=160K,TIME=2
/*SETUP DEVICE=2314,ID=NUSYS0
// EXEC FHG,LIB=NUSYS,NAME=MITRA
//G.FT08F001  DD  UNIT=SYSDA,SPACE=(TRK,2)
//G.FT01F001  DD  UNIT=2314,VOL=SER=NUSYS0,DSN=GRUBA.KFKINR,DISP=SHR
//G.FT09F001  DD  UNIT=SYSDA,SPACE=(TRK,10)
//G.FT03F001  DD  UNIT=2314,VOL=SER=NUSYS0,DSN=KRIEG.MIG,DISP=SHR
//G.SYSIN  DD *
```

Input

```
'KFKINR   '  1
@U 235@  @U 235@  1  0
4  @FCAPT@  @FG   @  @FSTAT@  2
   @FFISS@  @FF   @  @FSTAT@  2
   @NUE  @  @NUE  @  @SGKE @  0
   @1/V  @  @1/V  @  @S1/V @  0  0  0
14  14  14  14  26
@U 235@  @U 235@  1  0
1  @FELSC@  @FN   @  @MIGR @  1  0  1
18  18  18  18  26
@FN   @  @MIGR @  1  18
@0    @  @0  16@  0  0
1  @FTOT @  @FT1  @  @STRK @  3  0  0
4  4  4  4  26
@0    @  @0  16@  0  0
1  @POEIK@  @SGNC0@  @FLUM @  6  0  0
3  3  3  3  26
@ENDE @  @ENDE @  0  0
```

On the following pages the output of the results is given.

STAND DER GRUBA BIBLIOTHEK VOM 110473

***PROTOKOLL DER AUF GRUBA VORHANDENEN WERTE

```
    14  U 235     FCAPT       1   20    3    6  0.82655382E 00  0.87577558E 00  0.95213795E 00  0.99440503E 00  0.99944246E 00
                                                 0.99994928E 00  0.88305843E 00  0.91661859E 00  0.97080392E 00  0.99681687E 00
                                                 0.99968177E 00  0.99997103E 00  0.92961776E 00  0.93929619E 00  0.98162657E 00
                                                 0.99792618E 00  0.99979174E 00  0.99998099E 00
    14  U 235     FFISS       1   20    3    6  0.83162820E 00  0.87963021E 00  0.95064557E 00  0.99416208E 00  0.99941820E 00
                                                 0.99994701E 00  0.88404781E 00  0.91723305E 00  0.96953821E 00  0.99667770E 00
                                                 0.99966776E 00  0.99996966E 00  0.92950916E 00  0.93799019E 00  0.98081881E 00
                                                 0.99783540E 00  0.99978262E 00  0.99998009E 00
    14  U 235     NUE         0    1  0.24229889E 01
    14  U 235     1/V         0    1  0.18983993E-07
```

***ENDE DES PROTOKOLLS DER AUF GRUBA VORHANDENEN WERTE

***PROTOKOLL DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN

DIE F-FAKTOREN FG IN GRUPPE 14 WURDEN NICHT RENORMIERT
ENDE VON TEST1 FUER MATERIAL U 235 TYP FG LABEL FSTAT

```
    14  U 235     FCAPT       1   20    3    6  0.77354968E 00  0.84917933E 00  0.95035458E 00  0.99418187E 00  0.99942076E 00
                                                 0.99994653E 00  0.80794090E 00  0.87867934E 00  0.96768624E 00  0.99666643E 00
                                                 0.99966973E 00  0.99996924E 00  0.83612275E 00  0.89682126E 00  0.97812480E 00
                                                 0.99780726E 00  0.99978393E 00  0.99997985E 00
```

DIE F-FAKTOREN FF IN GRUPPE 14 WURDEN NICHT RENORMIERT
ENDE VON TEST1 FUER MATERIAL U 235 TYP FF LABEL FSTAT

```
    14  U 235     FFISS       1   20    3    6  0.77513117E 00  0.85143816E 00  0.94899106E 00  0.99393761E 00  0.99939656E 00
                                                 0.99994475E 00  0.80581999E 00  0.87774932E 00  0.96637660E 00  0.99652636E 00
                                                 0.99965602E 00  0.99996859E 00  0.83280033E 00  0.89438051E 00  0.97724724E 00
                                                 0.99771470E 00  0.99977404E 00  0.99997896E 00
```

```
     14  U 235      NUE          0     1  0.24301538E 01


     14  U 235      1/V          0     1  0.19015328E-07
***ENDE DES PROTOKOLLS DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN



***PROTOKOLL DER AUF GRUBA VORHANDENEN WERTE

     18  U 235      FELSC        1    23     3     7  0.94173437E 00  0.94794637E 00  0.96915758E 00  0.99232912E 00  0.99857605E 00
                                                      0.99933267E 00  0.99941075E 00  0.95057607E 00  0.95670533E 00  0.97650814E 00
                                                      0.99464321E 00  0.99875784E 00  0.99923247E 00  0.99928051E 00  0.95741242E 00
                                                      0.96349984E 00  0.98134392E 00  0.99559671E 00  0.99851167E 00  0.99883902E 00
                                                      0.99887216E 00

***ENDE DES PROTOKOLLS DER AUF GRUBA VORHANDENEN WERTE

***PROTOKOLL DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN


 DIE F-FAKTOREN FN  IN GRUPPE   18 WURDEN NICHT RENORMIERT
   ENDE VON TEST1 FUER MATERIAL U 235    TYP FN       LABEL MIGR

     18  U 235      FELSC        1    20     3     6  0.94163764E 00  0.94783056E 00  0.96913391E 00  0.99258685E 00  0.99910563E 00
                                                      0.99990535E 00  0.95064503E 00  0.95673221E 00  0.97656202E 00  0.99510008E 00
                                                      0.99943763E 00  0.99993879E 00  0.95793915E 00  0.96402717E 00  0.98195404E 00
                                                      0.99655139E 00  0.99961168E 00  0.99995881E 00

***ENDE DES PROTOKOLLS DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN



***PROTOKOLL DER AUF GRUBA VORHANDENEN WERTE

      4  0          FTOT         1     8     1     6  0.29999995E 00  0.92999995E 00  0.98996586E 00  0.99895096E 00  0.99989462E 00
                                                      0.99998945E 00

***ENDE DES PROTOKOLLS DER AUF GRUBA VORHANDENEN WERTE

   ENDE VON TEST3 FUER MATERIAL O  16    TYP FT1      LABEL STRK     IN DEN GRUPPEN    4 BIS    4
```

```
***PROTOKOLL DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN

      4  0          FTOT         1    7    1    5  0.59960687E 00  0.95077115E 00  0.99385238E 00  0.99936974E 00  0.99994141E 00
***ENDE DES PROTOKOLLS DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN


***PROTOKOLL DER AUF GRUBA VORHANDENEN WERTE
      3  0          POEIK        3    3    3  0.83618730E 00  0.16381270E 00
***ENDE DES PROTOKOLLS DER AUF GRUBA VORHANDENEN WERTE
   ENDE VON TEST6 FUER MATERIAL 0  16    TYP SGNCO    LABEL FLUM     IN DEN GRUPPEN    3 BIS     3

***PROTOKOLL DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN

      3  0          POEIK        3    3    3  0.88369995E 00  0.11628997E 00
***ENDE DES PROTOKOLLS DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN WERDEN
```

```
C     MITRA - EIN PROGRAMM ZUR TRANSFORMATION DER MIGROS AUSGABE          10
C             IN GRUBA EINGABE                                           20
C                                                                        30
      REAL*8 GMAT,MMAT,ID,GTYP(50),MTYP(50),LAB(50),END,LWORT(2),LB(10),  40
     1FSTRUK(5),QSTRUK(5),RSTRUK(6),FLUM(3),GSTRUK(6),REMO(5),           50
     2MIGROS(5),FSTAT(5),MNAME(20),MLA(20),RNAME(20),RLA(20)             60
      DIMENSION FELD(2000),IFELD(2000),KENNZ(3,50),ITEST(50),F(10),      70
     1SIGMAM(100),T(10),SIGMA(10,100),FF(10,100,7),MOM(6),ARBF(2000),    80
     2IPS(100),IK(50),TK(100),NVARB(10,2,3),KKK(500),ICG(20,20),NZG(20)  90
     3,SIGO(10),IREN(100),SI(100),IROG(20,20),NRG(20),TEXT(5),ATXT(5)    100
      EQUIVALENCE (FELD(1),LWORT(1)),(FELD(1),IFELD(1))                  110
      DATA    QSTRUK/'SIGMAA  ','SIGMAN  ','SIGMANO1','SIGMAN1 ',       120
     1'SIGMAT1 '/,RSTRUK   /'SIGMAC  ','SIGMAN  ','SIGMAF  ','SIGMANC1',130
     2'SIGMAN1 ','SIGMAT1 '/,FSTRUK   /'FA      ','FN      ','FNO1    ',140
     3'FN1     ','FT1     '/,GSTRUK   /'FC      ','FN      ','FF      ',150
     4'FNO1    ','FN1     ','FT1     '/,                                160
     5FLUM   /'SGN     ','MUEL    ','SGNC    '/,                        170
     6REMO   /'SGT     ','SGN     ','MUEL    ','FLUX    ','SGNC    '/,180
     7MIGROS   /'SIGMA G ','SIGMA N ','SIGMA F ','SIGMAN1 ','SIGMAT1 '/,190
     8FSTAT   /'FG      ','FN      ','FF      ','FN1     ','FT1     '/ 200
      DATA END/'ENDE    '/,LB/'MIGR    ','FSTAT   ','STRK    ',          210
     1'SGKE    ','SMTOT   ','FLUM    ','SPALT   ','S1/V    ',          220
     2'REMO    ','THERM   '/,TEXT/'NICH','T RE','NORM','IERT','EN  '/,  230
     3ATXT/'    ','RENO','RMIE','RTEN','    '/                         240
      DATA MOM/'0   ','1   ','2   ','3   ','4   ','5   '/               250
      DATA NVARB(1,1,1)/0/,NVARB(1,2,1)/3/,NVARB(1,2,2)/1/,              260
     1NVARB(1,2,3)/0/,NVARB(3,1,1)/0/,NVARB(3,2,1)/1/,NVARB(3,2,2)/0/,   270
     1NVARB(4,1,1)/0/,                                                   280
     2NVARB(5,1,1)/3/,NVARB(6,1,1)/0/,NVARB(6,2,1)/3/,NVARB(7,1,1)/0/,   290
     3NVARB(8,1,1)/0/,NVARB(9,1,1)/0/,NVARB(9,2,1)/4/,NVARB(10,1,1)/0/   300
C                                                                        310
C     DAS FELD NVARB ENTHAELT DIE STANDARD-VERARBEITUNGSKENNZIFFERN FUER 320
C     GRUBA UND IST DIMENSIONIERT (INDEX DES LABELS IM FELD LB ,         330
C     TYPENGRUPPE , NUMMER DER VERARBEITUNGSKENNZIFFER)                  340
C                                                                        350
      CALL FSPIE                                                         360
      NINP=5                                                             370
      LANZ=10                                                            380
      NOUT=6                                                             390
      NF=8                                                               400
      NG=1                                                               410
      MIG=3                                                              420
      IGRU=9                                                             430
      CALL FREEFO (NINP,NF,NOUT,FELD,FELD,FELD)                          440
      READ(NF) ID,IPRO                                                   450
      J=2000                                                             460
      CALL GRB (ARBF,J,NG,ID,0,NDTUM,NGR,&20,&54)                        470
      WRITE(NOUT,47) NDTUM                                               480
   47 FORMAT(1H1/' STAND DER GRUBA - BIBLIOTHEK VOM',I10//)              490
      GO TO 999                                                          500
   20 WRITE(NOUT,34)                                                     510
   34 FORMAT(1HO/' ARBEITSFELD IN GRB ZU KLEIN')                         520
      GO TO 1000                                                         530
   54 WRITE(NOUT,55)                                                     540
   55 FORMAT(' FALSCHE GRUBA - IDENTIFIKATION')                          550
      GO TO 1000                                                         560

  999 READ(NF) GMAT,MMAT,ISPA,IV                                         570
      IF(GMAT.EQ.END.AND.MMAT.EQ.END) GO TO 1000                         580
      READ(NF) ITYP,(GTYP(I),MTYP(I),LAB(I),ITEST(I),I=1,ITYP),NIT,NREN  590
      IF(ITYP.LE.50)  GO TO 56                                           600
      WRITE(NOUT,57)                                                     610
   57 FORMAT(' DIE ANZAHL DER IN EINEM EINGABEBLOCK ZU VERARBEITENDEN TY  620
     1PEN IST AUF 50 BEGRENZT')                                          630
      GO TO 1000                                                         640
   56 IF(NIT.LE.20)  GO TO 72                                            650
      WRITE(NOUT,73)                                                     660
   73 FORMAT(' DIE ANZAHL DER IN EINEM EINGABEBLOCK UNGEPRUEFT AUF GRUBA  670
     1 ZU UEBERNEHMENDEN TYPEN IST AUF 20 BEGRENZT')                     680
      GO TO 1000                                                         690
   72 IF(NREN.LE.20)  GO TO 97                                           700
      WRITE(NOUT,96)                                                     710
   96 FORMAT(' DIE ANZAHL DER IN EINEM EINGABEBLOCK NICHT ZU RENORMIEREN  720
     1DEN TYPEN IST AUF 20 BEGRENZT')                                    730
      GO TO 1000                                                         740
   97 IF(IV.EQ.0)  GO TO 66                                              750
      DO 49 I=1,ITYP                                                     760
      READ(NF) J,(KENNZ(K,I),K=1,J)                                      770
   49 IK(I)=J                                                            780
   66 READ(NF) IOGRUP,IUGRUP,MOGRUP,MUGRUP,IGSATZ                        790
      DO 36 I=1,ITYP                                                     800
      IF(LAB(I).EQ.LB(10))  GO TO 37                                     810
   36 CONTINUE                                                           820
      GO TO 33                                                           830
   37 READ(NF) NTHERM                                                    840
   33 WRITE(NOUT,48)                                                     850
   48 FORMAT(1HO///)                                                     860
      IF(IPRO)4,4,53                                                     870
   53 WRITE(NOUT,58)                                                     880
   58 FORMAT(' ***PROTOKOLL DER AUF GRUBA VORHANDENEN WERTE'/)           890
    4 DO 2 J=IUGRUP,IOGRUP                                               900
      DO 2 I=1,ITYP                                                      910
      IF(LAB(I).EQ.LB(10))  GO TO 2                                      920
      CALL DATNAM(J,GMAT,GTYP(I),NV,NDAT,FELD,&21,&22)                   930
      GO TO 3                                                            940
   22 WRITE (NOUT,23) J,GMAT,GTYP(I)                                     950
   23 FORMAT(/'    FEHLER IN DATNAM FUER GRUPPE',I5,' MATERIAL ',A8,' TY 960
     1P ',A8/)                                                           970
      GO TO 2                                                            980
    3 IF(IPRO)2,2,5                                                      990
    5 IF(NV.NE.0)  GO TO 6                                              1000
      WRITE(NOUT,50)J,GMAT,GTYP(I),NV,NDAT,(FELD(LRJ),LRJ=1,NDAT)       1010
      GO TO 2                                                           1020
    6 IF(NV.EQ.3.OR.NV.EQ.1)  GO TO 59                                  1030
   60 IFELD(1)=NFXFL(FELD(1))                                           1040
      WRITE(NOUT,51)J,GMAT,GTYP(I),NV,NDAT,(FELD(LRJ),LRJ=1,NDAT)       1050
      GO TO 2                                                           1060
   59 IF(LAB(I).EQ.LB(5).OR.LAB(I).EQ.LB(6))  GO TO 60                  1070
      IFELD(1)=NFXFL(FELD(1))                                           1080
      IFELD(2)=NFXFL(FELD(2))                                           1090
      WRITE(NOUT,52)J,GMAT,GTYP(I),NV,NDAT,(FELD(LRJ),LRJ=1,NDAT)       1100
      GO TO 2                                                           1110
   21 IF(IPRO)2,2,7                                                     1120
```

```
 7 WRITE(NOUT,8)J,GMAT,GTYP(I)                                          1130
 8 FORMAT('    GRUPPE',I5,' MATERIAL',A9,' TYP',A9,' NOCH NICHT AUF G 1140
  1RUBA ENTHALTEN')                                                     1150
 2 CONTINUE                                                             1160
   DO 39 I=1,ITYP                                                       1170
   IF(LAB(I).EQ.LB(10))  GO TO 40                                       1180
   GO TO 39                                                             1190
40 CALL DATNAM (NTHERM,GMAT,GTYP(I),NV,NDAT,FELD,&42,&43)               1200
   GO TO 44                                                             1210
43 IF(IPRO)39,39,67                                                     1220
67 WRITE(NOUT,23) NTHERM,GMAT,GTYP(I)                                   1230
   GO TO 39                                                             1240
44 IF(IPRO)39,39,45                                                     1250
45 WRITE(NOUT,50)NTHERM,GMAT,GTYP(I),NV,NDAT,(FELD(LRJ),LRJ=1,NDAT)     1260
   GO TO 39                                                             1270
42 IF(IPRO)39,39,46                                                     1280
46 WRITE(NOUT,8)NTHERM,GMAT,GTYP(I)                                     1290
39 CONTINUE                                                             1300
   IF(IPRO)62,62,63                                                     1310
63 WRITE(NOUT,61)                                                       1320
61 FORMAT(/' ***ENDE DES PROTOKOLLS DER AUF GRUBA VORHANDENEN WERTE'/   1330
  1)                                                                    1340
62 IF(NIT.EQ.0)  GO TO 68                                               1350
   DO 69 I=1,NIT                                                        1360
   READ (NF) MNAME(I),MLA(I),K,(IOG(I,J),J=1,K)                         1370
   NZG(I)=K                                                             1380
   IF(K.GT.20)  GO TO 70                                                1390
69 CONTINUE                                                             1400
   GO TO 68                                                             1410
70 WRITE(NOUT,71) MNAME(I),MLA(I)                                       1420
71 FORMAT(' DIE DATEN DES TYPS',A9,' AUS DEM LABEL',A9,' SOLLEN IN ME   1430
  1HR ALS 20 GRUPPEN UNGEPRUEFT UEBERNOMMEN WERDEN')                    1440
   GO TO 1000                                                           1450
68 IF(NREN.EQ.0)  GO TO 41                                              1460
   DO 98 I=1,NREN                                                       1470
   READ(NF) RNAME(I),RLA(I),K,(IROG(I,J),J=1,K)                         1480
   NRG(I)=K                                                             1490
   IF(K.GT.20)  GO TO 99                                                1500
98 CONTINUE                                                             1510
   GO TO 41                                                             1520
99 WRITE(NOUT,38) RNAME(I),RLA(I)                                       1530
38 FORMAT(' DIE DATEN DES TYPS',A9,' AUS DEM LABEL',A9,' SOLLEN IN ME   1540
  1HR ALS 20 GRUPPEN NICHT RENORMIERT WERDEN')                          1550
   GO TO 1000                                                           1560
41 K=0                                                                  1570
   DO 1 I=1,ITYP                                                        1580
   IF(ITEST(I).EQ.0) GO TO 1                                            1590
   J=ITEST(I)                                                           1600
   GO TO (1,1,9,1,11,12,10,1,13,1),J                                    1610
 9 DO 81 IE=MUGRUP,MOGRUP                                               1620
81 KKK(IE)=0                                                            1630
   CALL TEST3(MMAT,MTYP(I),LAB(I),MOGRUP,MUGRUP,ISPA,IGSATZ,MIG,        1640
  1NOUT,FSTRUK,GSTRUK,      FELD,IFELD,LWORT,KKK)                       1650
   IF(NIT.EQ.0)  GO TO 79                                               1660
   DO 74 IE=MUGRUP,MOGRUP                                               1670
   IF(KKK(IE).EQ.0)  GO TO 74                                           1680
   DO 75 IG=1,NIT                                                       1690
   IF(MNAME(IG).NE.MTYP(I))  GO TO 75                                   1700
   IF(MLA(IG).NE.LAB(I))  GO TO 75                                      1710
   IZ=NZG(IG)                                                           1720
   DO 76 IZG=1,IZ                                                       1730
   IF(IE.NE.IOG(IG,IZG))  GO TO 76                                      1740
   KKK(IE)=0                                                            1750
   WRITE(NOUT,80) LAB(I),MTYP(I),IE                                     1760
80 FORMAT(' TROTZ IN TEST1 FESTGESTELLTER MAENGEL  WERDEN DIE DATEN A   1770
  1US'/' LABEL',A9,' TYP',A9,' IN GRUPPE',I5,' FUER GRUBA BEREITGESTE   1780
  2LLT')                                                                1790
   GO TO 74                                                             1800
76 CONTINUE                                                             1810
   GO TO 74                                                             1820
75 CONTINUE                                                             1830
74 CONTINUE                                                             1840
79 DO 77 IE=MUGRUP,MOGRUP                                               1850
   IF(KKK(IE).NE.0)  GO TO 78                                           1860
77 CONTINUE                                                             1870
   GO TO 1                                                              1880
78 K=1                                                                  1890
   GO TO 1                                                              1900
10 CALL TEST7(MMAT,MTYP(I),LAB(I),IGSATZ,MIG,NOUT,FELD,IFELD,LWORT,K)   1910
   GO TO 1                                                              1920
11 CALL TEST5(MMAT,LAB(I),MOGRUP,MUGRUP,MIG,NOUT,FELD,IFELD,LWORT,K)    1930
   GO TO 1                                                              1940
12 CALL TEST6(MMAT,MTYP(I),LAB(I),MOGRUP,MUGRUP,MIG,NOUT,FELD,IFELD,    1950
  1LWORT,K)                                                             1960
   GO TO 1                                                              1970
13 CALL TEST9(MMAT,MTYP(I),LAB(I),MOGRUP,MUGRUP,MIG,NOUT,FELD,          1980
  1IFELD,LWORT,K)                                                       1990
 1 CONTINUE                                                             2000
   IF(K.EQ.0) GO TO 24                                                  2010
   WRITE(NOUT,25)                                                       2020
25 FORMAT(/'     ENDE DER PRUEFUNG DER MIGROS - AUSGABE')               2030
   STOP                                                                 2040
24 WRITE(NOUT,64)                                                       2050
64 FORMAT(//' ***PROTOKOLL DER WERTE, DIE NEU AUF GRUBA AUFGENOMMEN W   2060
  1ERDEN')                                                              2070
   DO 26 I=1,ITYP                                                       2080
   WRITE(NOUT,130)                                                      2090
   WRITE(NOUT,130)                                                      2100
   REWIND MIG                                                           2110
27 IE=IOGRUP                                                            2120
   MOG=MOGRUP                                                           2130
   IG=IUGRUP                                                            2140
   IZ=MUGRUP                                                            2150
   IZG=IGSATZ+1-MOGRUP                                                  2160
35 READ(MIG)J,(FELD(K),K=1,J)                                           2170
   IF(J.NE.0) GO TO 35                                                  2180
   BACKSPACE MIG                                                        2190
   READ (MIG) J,(FELD(K),K=1,2)                                         2200
   IF(LWORT(1).EQ.END)  GO TO 31                                        2210
   IF(LWORT(1).NE.LAB(I))  GO TO 35                                     2220
   DO 28 K=1,LANZ                                                       2230
   IF(LWORT(1).EQ.LB(K)) GO TO 29                                       2240
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   28 CONTINUE                                                          2250
      WRITE (NOUT,30) LWORT(1)                                          2260
   30 FORMAT('     DER LABEL ',A9,' IST KEIN MIGROS - STANDARDLABEL, DIE 2270
     1 DATEN WERDEN NICHT BERUECKSICHTIGT')                             2280
      GO TO 26                                                          2290
   31 WRITE(NOUT,32) LAB(I)                                             2300
   32 FORMAT(1H ,'     DER LABEL',A9,' KANN IN DER MIGROS - AUSGABE NICHT 2310
     1 GEFUNDEN WERDEN'/'     ODER DIE GEWUENSCHTEN DATEN SIND NICHT IN D 2320
     2EM ANGEGEBENEN BLOCK ENTHALTEN')                                  2330
      GO TO 26                                                          2340
   29 GO TO (100,100,200,300,400,500,600,700,800,900),K                 2350
C                                                                       2360
C     VERARBEITUNG DER AUSGABE DER MIGROS - PROGRAMME NR. 1 UND 2       2370
C                                                                       2380
  100 LT=0                                                              2390
      NS=0                                                              2400
      READ(MIG)J,(FELD(K),K=1,J)                                        2410
      IF(J.NE.0) GO TO 101                                              2420
  106 BACKSPACE MIG                                                     2430
      GO TO 27                                                          2440
  101 IF(LWORT(1).NE.MMAT) GO TO 27                                     2450
  107 IF(IFELD(4).LT.IZG-1)  GO TO 105                                  2460
      IF(IFELD(4).EQ.IZG-1)  GO TO 102                                  2470
      GO TO 27                                                          2480
  105 READ(MIG)J,(FELD(K),K=1,J)                                        2490
      IF(J.EQ.0) GO TO 106                                              2500
      IF(LWORT(1).NE.MMAT) GO TO 105                                    2510
      GO TO 107                                                         2520
  102 IF(NS.GT.0)  GO TO 104                                            2530
      NS=1                                                              2540
      DO 103 L=1,5                                                      2550
      IF(MIGROS(L).EQ.MTYP(I)) GO TO 104                                2560
  103 CONTINUE                                                          2570
      GO TO 108                                                         2580
  104 LT=LT+1                                                           2590
      IB=0                                                              2600
      T(LT)=FELD(3)                                                     2610
  170 READ(MIG)J,(FELD(K),K=1,J)                                        2620
      IB=IB+1                                                           2630
      SIGMA(LT,IB)=FELD(L)                                              2640
  165 READ(MIG) J,(FELD(K),K=1,J)                                       2650
      IF(J.EQ.0)  GO TO 163                                             2660
      IF(LWORT(1).EQ.MMAT)  GO TO 164                                   2670
      GO TO 165                                                         2680
  164 IZ=IZ+1                                                           2690
      IZG=IZG+1                                                         2700
      IF(IZ.LE.MOGRUP)  GO TO 166                                       2710
      IZ=MUGRUP                                                         2720
      IZG=IGSATZ+1-MOGRUP                                               2730
  167 IF(FELD(3).NE.T(LT))  GO TO 107                                   2740
  168 READ(MIG) J,(FELD(K),K=1,J)                                       2750
      IF(J.EQ.0)  GO TO 163                                             2760
      IF(LWORT(1).EQ.MMAT)  GO TO 167                                   2770
      GO TO 168                                                         2780
  166 IF(IFELD(4).LT.IZG-1)  GO TO 169                                  2790
      IF(IFELD(4).EQ.IZG-1)  GO TO 170                                  2800
  169 READ(MIG) J,(FELD(K),K=1,J)                                       2810
      IF(J.EQ.0)  GO TO 106                                             2820
      IF(LWORT(1).NE.MMAT)  GO TO 169                                   2830
      GO TO 166                                                         2840
  163 DO 171 K=1,IB                                                     2850
      SIGMAM(K)=0                                                       2860
      DO 171 J=1,LT                                                     2870
  171 SIGMAM(K)=AMAX1(SIGMAM(K),SIGMA(J,K))                             2880
      DO 172 K=1,IB                                                     2890
      DO 173 J=1,LT                                                     2900
      IF(SIGMAM(K).EQ.SIGMA(J,K))  GO TO 174                            2910
  173 CONTINUE                                                          2920
  174 TK(K)=T(J)                                                        2930
  172 CONTINUE                                                          2940
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(1,1,1)                              2950
      M=1                                                               2960
      DO 175 J=1,IB                                                     2970
      WRITE(IGRU) IE,GMAT,GTYP(I),KENNZ(1,I),M,SIGMAM(J)                2980
      WRITE(6,180)IE,GMAT,GTYP(I),KENNZ(1,I),M,SIGMAM(J),TK(J)          2990
  180 FORMAT(I8,2A10,2I5,E16.8,' BEI DER TEMPERATUR T=',F8.2)           3000
      IE=IE-1                                                           3010
  175 CONTINUE                                                          3020
      GO TO 26                                                          3030
C                                                                       3040
  108 DO 109 IB=1,5                                                     3050
      IF(FSTAT(IB).EQ.MTYP(I)) GO TO 110                                3060
  109 CONTINUE                                                          3070
      GO TO 217                                                         3080
  110 LT=0                                                              3090
      IF(IV.EQ.1)  GO TO 114                                            3100
      KENNZ(1,I)=NVARB(1,2,1)                                           3110
      KENNZ(2,I)=NVARB(1,2,2)                                           3120
      KENNZ(3,I)=NVARB(1,2,3)                                           3130
  114 L=0                                                               3140
      LT=LT+1                                                           3150
      T(LT)=FELD(3)                                                     3160
  113 READ(MIG)J,(FELD(K),K=1,J)                                        3170
      NS=0                                                              3180
      L=L+1                                                             3190
      SIGMA(LT,L)=FELD(IB)                                              3200
  112 READ(MIG)J,(FELD(K),K=1,J)                                        3210
      IF(J.EQ.0) GO TO 117                                              3220
      IF(LWORT(1).EQ.MMAT) GO TO 111                                    3230
      NS=NS+1                                                           3240
      SIGO(NS)=FELD(1)                                                  3250
      FF(LT,L,NS)=FELD(IB+1)                                            3260
      GO TO 112                                                         3270
  111 IZ=IZ+1                                                           3280
      IF(IZ.LE.MOGRUP) GO TO 113                                        3290
      IZ=MUGRUP                                                         3300
  115 IF(FELD(3).NE.T(LT).AND.IFELD(4).EQ.IZG-1)  GO TO 114             3310
  116 READ(MIG)J,(FELD(K),K=1,J)                                        3320
      IF(J.EQ.0) GO TO 117                                              3330
      IF(LWORT(1).EQ.MMAT) GO TO 115                                    3340
      GO TO 116                                                         3350
  117 DO 120 K=IUGRUP,IOGRUP                                            3360
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      CALL DATNAM(K,GMAT,GTYP(I),NV,NDAT,FELD,&136,&136)                3370
      L=NFXFL(FELD(1))                                                  3380
      IF(NV.EQ.3)  GO TO 134                                            3390
      IF(NV.EQ.1)  GO TO 135                                            3400
      GO TO 136                                                         3410
  135 IF(L.EQ.1)  GO TO 136                                             3420
      DO 137 M=3,NDAT                                                   3430
      N=NDAT-M+3                                                        3440
  137 FELD(N+L)=FELD(N)                                                 3450
      NDAT=NDAT+L                                                       3460
      GO TO (138,138,139),L                                             3470
  138 FELD(3)=900.                                                      3480
      FELD(4)=2100.                                                     3490
      GO TO 134                                                         3500
  139 FELD(3)=300.                                                      3510
      FELD(4)=900.                                                      3520
      FELD(5)=2100.                                                     3530
  134 DO 120 M=1,L                                                      3540
      DO 121 N=1,LT                                                     3550
      IF(FELD(M+2).EQ.T(N)) GO TO 120                                   3560
  121 CONTINUE                                                          3570
      WRITE (NOUT,122) GTYP(I),FELD(M+2),K                              3580
  122 FORMAT (2X,'DER TYP',A9,' KANN NICHT BEARBEITET WERDEN, WEIL DIE G 3590
     1RUBA - TEMPERATUR',E16.8/'     IN GRUBA - GRUPPE',I5,' NICHT IN DER 3600
     2 MIGROS - RECHNUNG BERUECKSICHTIGT WURDE')                        3610
      GO TO 26                                                          3620
  120 CONTINUE                                                          3630
  136 MI=MOGRUP-MUGRUP+1                                                3640
      DO 178 J=1,MI                                                     3650
      IPS(J)=0                                                          3660
  178 IREN(J)=0                                                         3670
      ID=0                                                              3680
      IF(NREN.EQ.0)  GO TO 197                                          3690
      DO 198 J=1,MI                                                     3700
      DO 127 MZ=1,NREN                                                  3710
      IF(RNAME(MZ).NE.MTYP(I))  GO TO 127                               3720
      IF(RLA(MZ).NE.LAB(I))  GO TO 127                                  3730
      MX=NRG(MZ)                                                        3740
      DO 176 MY=1,MX                                                    3750
      IF(MOGRUP-J+1.NE.IROG(MZ,MY))  GO TO 176                          3760
      IREN(J)=1                                                         3770
      GO TO 177                                                         3780
  176 CONTINUE                                                          3790
  127 CONTINUE                                                          3800
      ID=1                                                              3810
      GO TO 198                                                         3820
  177 DO 198 K=1,LT                                                     3830
      M=0                                                               3840
      DO 199 L=1,NS                                                     3850
      IF(FF(K,J,L).GE.0.99999.AND.FF(K,J,L).LE.1.0001)  FF(K,J,L)=1.    3860
      IF(FF(K,J,L).LE.1..AND.FF(K,J,L).GT.0)  GO TO 199                 3870
      IF(NIT.EQ.0)  GO TO 118                                           3880
      DO 119 MZ=1,NIT                                                   3890
      IF(MNAME(MZ).NE.MTYP(I))  GO TO 119                               3900
      IF(MLA(MZ).NE.LAB(I))  GO TO 119                                  3910
      MX=NZG(MZ)                                                        3920
      DO 123 MY=1,MX                                                    3930
      IF(MOGRUP-J+1.EQ.IOG(MZ,MY))  GO TO 199                           3940
  123 CONTINUE                                                          3950
      GO TO 118                                                         3960
  119 CONTINUE                                                          3970
  118 M=1                                                               3980
  199 CONTINUE                                                          3990
      IF(M.EQ.0)  GO TO 198                                             4000
      LRJ=MOGRUP-J+1                                                    4010
      WRITE(NOUT,131) LAB(I),MTYP(I),LRJ,T(K)                           4020
  131 FORMAT('  LABEL ',A6,': DER NICHT RENORMIERTE F-FAKTOR ',A4,' WIRD 4030
     1 IN GRUPPE',I5,' BEI DER TEMPERATUR',F10.2,' GROESSER 1 ODER KLEIN 4040
     2ER GLEICH 0'/15X,' DIESE GRUPPE WIRD NICHT FUER GRUBA BEREITGESTEL 4050
     3LT')                                                              4060
      IPS(J)=1                                                          4070
  198 CONTINUE                                                          4080
      IF(ID.EQ.0)  GO TO 132                                            4090
  197 DO 124 K=1,MI                                                     4100
      SIGMAM(K)=0.                                                      4110
      DO 124 J=1,LT                                                     4120
  124 SIGMAM(K)=AMAX1(SIGMAM(K),SIGMA(J,K))                             4130
      DO 153 K=1,MI                                                     4140
      DO 152 J=1,LT                                                     4150
      IF(SIGMAM(K).EQ.SIGMA(J,K))  GO TO 154                            4160
  152 CONTINUE                                                          4170
  154 TK(K)=T(J)                                                        4180
  153 CONTINUE                                                          4190
      DO 1007 J=1,MI                                                    4200
      IF(IREN(J).EQ.1)  GO TO 1007                                      4210
      S=0                                                               4220
      DO 191 K=1,LT                                                     4230
  191 SI(K)=1.-SIGMA(K,J)/SIGMAM(J)                                     4240
      DO 192 K=1,LT                                                     4250
  192 S=AMAX1(S,SI(K))                                                  4260
      IF(S.GT.1.E-5)  GO TO 194                                         4270
      IREN(J)=1                                                         4280
      GO TO 1007                                                        4290
  194 DO 125 K=1,LT                                                     4300
      SIG=SIGMA(K,J)/SIGMAM(J)                                          4310
      DO 125 L=1,NS                                                     4320
      FF(K,J,L)=FF(K,J,L)*SIG                                           4330
  125 CONTINUE                                                          4340
 1007 CONTINUE                                                          4350
  193 DO 1008 J=1,MI                                                    4360
      IF(IREN(J).EQ.1)  GO TO 1008                                      4370
      DO 145 L=1,NS                                                     4380
      DO 1001 K=2,LT                                                    4390
      IF(ABS((FF(K,J,L)-FF(K-1,J,L))*2./(FF(K-1,J,L)+FF(K,J,L))).LE.    4400
     11.E-5)  GO TO 1001                                                4410
      GO TO 145                                                         4420
 1001 CONTINUE                                                          4430
      FFF=0                                                             4440
      DO 1002 K=1,LT                                                    4450
 1002 FFF=FFF+FF(K,J,L)                                                 4460
      FFF=FFF/FLOAT(LT)                                                 4470
      DO 1003 K=1,LT                                                    4480
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1003 FF(K,J,L)=FFF                                                      4490
 145 CONTINUE                                                           4500
1008 CONTINUE                                                           4510
     DO 1004 J=1,MI                                                     4520
     IF(IREN(J).EQ.1)  GO TO 1004                                       4530
     DO 1006 K=1,LT                                                     4540
     M=0                                                                4550
     DO 1005 L=1,NS                                                     4560
     IF(FF(K,J,L).GE.0.99999.AND.FF(K,J,L).LE.1.0001)  FF(K,J,L)=1.     4570
     IF(FF(K,J,L).LE.1..AND.FF(K,J,L).GT.0.)  GO TO 1005                4580
     IF(NIT.EQ.0)  GO TO 162                                            4590
     DO 181 MZ=1,NIT                                                    4600
     IF(MNAME(MZ).NE.MTYP(I))  GO TO 181                                4610
     IF(MLA(MZ).NE.LAB(I))  GO TO 181                                   4620
     MX=NZG(MZ)                                                         4630
     DO 161 MY=1,MX                                                     4640
     IF(MOGRUP-J+1.EQ.IOG(MZ,MY))  GO TO 1005                           4650
 161 CONTINUE                                                           4660
     GO TO 162                                                          4670
 181 CONTINUE                                                           4680
 162 M=1                                                                4690
1005 CONTINUE                                                           4700
     IF(M.EQ.0)  GO TO 1006                                             4710
     LRJ=MOGRUP-J+1                                                     4720
     WRITE (NOUT,126) LAB(I),MTYP(I),LRJ,T(K)                           4730
 126 FORMAT(2X,'LABEL ',A6,': DER RENORMIERTE F-FAKTOR ',A4,' WIRD IN G 4740
    1RUPPE',I5,' BEI DER TEMPERATUR',F10.2,' GROESSER 1 ODER KLEINER GL 4750
    2EICH 0'/16X,'DIESE GRUPPE WIRD NICHT FUER GRUBA BEREITGESTELLT')   4760
     IPS(J)=1                                                           4770
1006 CONTINUE                                                           4780
1004 CONTINUE                                                           4790
 132 WRITE(NOUT,130)                                                    4800
 130 FORMAT(1HO)                                                        4810
     M=MOGRUP                                                           4820
     DO 129 J=1,MI                                                      4830
     IF(IREN(J).EQ.0)  GO TO 195                                        4840
     WRITE(NOUT,196) FSTAT(IB),M                                        4850
 196 FORMAT(2X,'DIE F-FAKTOREN ',A3,' IN GRUPPE',I5,' WURDEN NICHT RENO 4860
    1RMIERT')                                                           4870
     GO TO 129                                                          4880
 195 WRITE(NOUT,128)FSTAT(IB),M,TK(J)                                   4890
 128 FORMAT(2X,'DIE F-FAKTOREN ',A3,' IN GRUPPE',I5,' WURDEN AUF DEN QU 4900
    2ERSCHNITT BEI UNENDLICHER VERDUENNUNG FUER DIE TEMPERATUR T =',    4910
    3F7.2,' NORMIERT')                                                  4920
 129 M=M-1                                                              4930
     IF(ITEST(I).EQ.1)  GO TO 190                                       4940
     IF(ITEST(I).NE.2)  GO TO 182                                       4950
 190 CALL TEST1(MMAT,MTYP(I),LAB(I),FSTAT,MOGRUP,NOUT,FF,LT,NS,MI,      4960
    1SIGO,T,IREN,TEXT,ATXT,IPS)                                         4970
 182 WRITE(NOUT,130)                                                    4980
     K=0                                                                4990
     IF(LT.EQ.3)  GO TO 140                                             5000
     IF(LT.EQ.2)  GO TO 141                                             5010
     GO TO 142                                                          5020
 140 IF(T(1).EQ.300..AND.T(2).EQ.900..AND.T(3).EQ.2100.)  GO TO 143     5030
     GO TO 142                                                          5040
 141 IF(T(1).EQ.900..AND.T(2).EQ.2100.)  GO TO 143                      5050
     GO TO 142                                                          5060
 143 IF(IV.EQ.0)  GO TO 155                                             5070
     IF(IK(I).GE.2)  GO TO 155                                          5080
     WRITE(NOUT,156) LAB(I),GTYP(I)                                     5090
 156 FORMAT (2X,'FUER DEN LABEL ',A9,' UND DEN TYP ',A8,' WURDE KEINE G 5100
    1RUBA VERARBEITUNGSKENNZIFFER FUER DEN FALL,'/'    DASS NUR STANDAR 5110
    2DTEMPERATUREN VORLIEGEN, BEREITGESTELLT')                          5120
     GO TO 1000                                                         5130
 155 KE=KENNZ(2,I)                                                      5140
     DO 144 J=IUGRUP,ICGRUP                                             5150
     K=K+1                                                              5160
     IF(IPS(K).EQ.0)  GO TO 183                                         5170
     IF(NIT.EQ.0)  GO TO 144                                            5180
     DO 184 MZ=1,NIT                                                    5190
     IF(MNAME(MZ).NE.MTYP(I))  GO TO 184                                5200
     IF(MLA(MZ).NE.LAB(I))  GO TO 184                                   5210
     MX=NZG(MZ)                                                         5220
     DO 185 MY=1,MX                                                     5230
     IF(MOGRUP-J+1.EQ.IOG(MZ,MY))  GO TO 183                            5240
 185 CONTINUE                                                           5250
     GO TO 144                                                          5260
 184 CONTINUE                                                           5270
     GO TO 144                                                          5280
 183 MS=NS                                                              5290
 148 DO 146 M=1,LT                                                      5300
     IF(FF(M,K,MS).NE.1.)  GO TO 147                                    5310
 146 CONTINUE                                                           5320
     MS=MS-1                                                            5330
     IF(MS.GT.0)  GO TO 148                                             5340
     IF(IV.EQ.0)  GO TO 159                                             5350
     IF(IK(I).GE.3)  GO TO 159                                          5360
     GO TO 160                                                          5370
 159 KE=KENNZ(3,I)                                                      5380
     M=1                                                                5390
     WRITE(IGRU)IE,GMAT,GTYP(I),KE,M,FF(1,K,1)                          5400
     WRITE(6,50)IE,GMAT,GTYP(I),KE,M,FF(1,K,1)                          5410
  50 FORMAT(I8,2A10,2I5,5E16.8/(38X,5E16.8))                            5420
  88 FORMAT(I8,2A10,2I5,5E16.8)                                         5430
     GO TO 144                                                          5440
 147 M=LT*MS+2                                                          5450
     WRITE(IGRU)IE,GMAT,GTYP(I),KE      ,M,LT,MS,((FF(L,K,IF),         5460
    1IF=1,MS),L=1,LT)                                                   5470
     IF(MS*LT.LE.5)  GO TO 94                                           5480
     WRITE(6,52)IE,GMAT,GTYP(I),KE      ,M,LT,MS,((FF(L,K,IF),         5490
    1IF=1,MS),L=1,LT)                                                   5500
     GO TO 144                                                          5510
  94 WRITE(6,92)IE,GMAT,GTYP(I),KE      ,M,LT,MS,((FF(L,K,IF),         5520
    1IF=1,MS),L=1,LT)                                                   5530
 144 IE=IE-1                                                            5540
     GO TO 26                                                           5550
 142 DO 133 J=IUGRUP,ICGRUP                                             5560
     K=K+1                                                              5570
     IF(IPS(K).EQ.0)  GO TO 186                                         5580
     IF(NIT.EQ.0)  GO TO 133                                            5590
     DO 187 MZ=1,NIT                                                    5600
```

```
      IF(MNAME(MZ).NE.MTYP(I))  GO TO 187                                5610
      IF(MLA(MZ).NE.LAB(I))  GO TO 187                                   5620
      MX=NZG(MZ)                                                         5630
      DO 188 MY=1,MX                                                     5640
      IF(MOGRUP-J+1.EQ.IOG(MZ,MY))  GO TO 186                            5650
  188 CONTINUE                                                           5660
      GO TO 133                                                          5670
  187 CONTINUE                                                           5680
      GO TO 133                                                          5690
  186 MS=NS                                                              5700
  151 DO 149 M=1,LT                                                      5710
      IF(FF(M,K,MS).NE.1.)  GO TO 150                                    5720
  149 CONTINUE                                                           5730
      MS=MS-1                                                            5740
      IF(MS.GT.0)  GO TO 151                                             5750
      IF(IV.EQ.0)  GO TO 157                                             5760
      IF(IK(I).GE.3)  GO TO 157                                          5770
  160 WRITE(NOUT,158) LAB(I),GTYP(I)                                     5780
  158 FORMAT (2X,'FUER DEN LABEL ',A9,' UND DEN TYP ',A9,' WURDE KEINE G 5790
     1RUBA VERARBEITUNGSKENNZIFFER FUER DEN FALL,'/'    DASS ALLE F-FAKT 5800
     2OREN GLEICH 1 SIND, BEREITGESTELLT')                               5810
      GO TO 1000                                                         5820
  157 KE=KENNZ(3,I)                                                      5830
      M=1                                                                5840
      WRITE(IGRU)IE,GMAT,GTYP(I),KE,M,FF(1,K,1)                          5850
      WRITE(6,50)IE,GMAT,GTYP(I),KE,M,FF(1,K,1)                          5860
      GO TO 133                                                          5870
  150 M=LT*MS+LT+2                                                       5880
      WRITE(IGRU)IE,GMAT,GTYP(I),KENNZ(1,I),M,LT,MS,(T(L),L=1,LT),       5890
     1(((FF(L,K,IF),IF=1,MS),L=1,LT)                                     5900
      IF(LT+LT*MS.LE.5)  GO TO 93                                        5910
      WRITE(6,52)IE,GMAT,GTYP(I),KENNZ(1,I),M,LT,MS,(T(L),L=1,LT),       5920
     1(((FF(L,K,IF),IF=1,MS),L=1,LT)                                     5930
   52 FORMAT(I8,2A10,4I5,5E16.8/(48X,5E16.8))                            5940
      GO TO 133                                                          5950
   93 WRITE(6,92)IE,GMAT,GTYP(I),KENNZ(1,I),M,LT,MS,(T(L),L=1,LT),       5960
     1(((FF(L,K,IF),IF=1,MS),L=1,LT)                                     5970
   92 FORMAT(I8,2A10,4I5,5E16.8)                                         5980
  133 IE=IE-1                                                            5990
      GO TO 26                                                           6000
C                                                                        6010
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 3              6020
C                                                                        6030
  200 READ(MIG)J,(FELD(K),K=1,J)                                         6040
      LRJ=2                                                              6050
      IF(ISPA.EQ.1) LRJ=3                                                6060
  205 IF(J.NE.0) GO TO 201                                               6070
      BACKSPACE MIG                                                      6080
      GO TO 27                                                           6090
  201 IF(LWORT(1).NE.MMAT) GO TO 27                                      6100
      IF(IFELD(3).LT.IZG-1)  GO TO 202                                   6110
      IF(IFELD(3).EQ.IZG-1)  GO TO 203                                   6120
      GO TO 27                                                           6130
  202 READ(MIG) J,(FELD(K),K=1,J)                                        6140
  204 READ(MIG)J,(FELD(K),K=1,J)                                         6150
      IF(J.EQ.LRJ+4) GO TO 204                                           6160
      GO TO 205                                                          6170
  203 READ(MIG)J,(FELD(K),K=1,J)                                         6180
      IF(ISPA.EQ.1) GO TO 206                                            6190
      DO 207 M=1,5                                                       6200
      IF(MTYP(I).EQ.QSTRUK(M)) GO TO 208                                 6210
  207 CONTINUE                                                           6220
      GO TO 210                                                          6230
  206 DO 209 M=1,6                                                       6240
      IF(MTYP(I).EQ.RSTRUK(M)) GO TO 208                                 6250
  209 CONTINUE                                                           6260
      GO TO 210                                                          6270
  208 J=1                                                                6280
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(3,1,1)                               6290
      WRITE (IGRU) IE,GMAT,GTYP(I),KENNZ(1,I),J,FELD(M)                  6300
      WRITE (6,50) IE,GMAT,GTYP(I),KENNZ(1,I),J,FELD(M)                  6310
  211 READ(MIG)J,(FELD(K),K=1,J)                                         6320
      IF(J.EQ.LRJ+4) GO TO 211                                           6330
  222 IE=IE-1                                                            6340
      IZG=IZG+1                                                          6350
      IZ=IZ+1                                                            6360
      IF(IZ.GT.MOGRUP) GO TO 26                                          6370
      GO TO 205                                                          6380
C                                                                        6390
  210 N=1                                                                6400
  219 READ (MIG)J,(FELD(K),K=1,J)                                        6410
      IF(J.NE.LRJ+4) GO TO 218                                           6420
      IF(ISPA.EQ.1) GO TO 212                                            6430
      DO 213 M=1,5                                                       6440
      IF(MTYP(I).EQ.FSTRUK(M)) GO TO 214                                 6450
  213 CONTINUE                                                           6460
  217 WRITE (NOUT,215) MTYP(I),LAB(I)                                    6470
  215 FORMAT(1H ,'DER GEWUENSCHTE TYP',A9,' IST NICHT UNTER DEM LABEL',  6480
     1A9,' ENTHALTEN')                                                   6490
      GO TO 26                                                           6500
  214 F(N)=FELD(M+1)                                                     6510
      N=N+1                                                              6520
      READ(MIG)J,(FELD(K),K=1,J)                                         6530
      IF(J.NE.LRJ+4)  GO TO 218                                          6540
      GO TO 214                                                          6550
  212 DO 216 M=1,6                                                       6560
      IF(MTYP(I).EQ.GSTRUK(M)) GO TO 214                                 6570
  216 CONTINUE                                                           6580
      GO TO 217                                                          6590
  218 NT=1                                                               6600
      N=N-1                                                              6610
  221 IF(F(N).LE.0)  GO TO 226                                           6620
      IF(F(N).LE.0.99999)  GO TO 220                                     6630
      IF(F(N).LE.1.0001)  GO TO 225                                      6640
  226 J=MOGRUP-IOGRUP+IE                                                 6650
      IF(NIT.EQ.0)  GO TO 229                                            6660
      DO 227 MZ=1,NIT                                                    6670
      IF(MNAME(MZ).NE.MTYP(I))  GO TO 227                                6680
      IF(MLA(MZ).NE.LAB(I))  GO TO 227                                   6690
      MX=NZG(MZ)                                                         6700
      DO 228 MY=1,MX                                                     6710
      IF(MOGRUP-IOGRUP+IE.EQ.IOG(MZ,MY))  GO TO 223                      6720
```

```
  228 CONTINUE                                                          6730
      GO TO 229                                                         6740
  227 CONTINUE                                                          6750
  229 WRITE(NOUT,224) LAB(I),MTYP(I),J                                  6760
  224 FORMAT(' LABEL',A9,': DER F-FAKTOR',A9,' WIRD IN GRUPPE',I5,      6770
     1' GROESSER 1. ODER KLEINER GLEICH 0'/17X,'DIESE GRUPPE WIRD NICHT 6780
     2FUER GRUBA BEREITGESTELLT')                                       6790
      GO TO 222                                                         6800
  225 F(N)=1.                                                           6810
  223 IF(F(N).NE.1.) GO TO 220                                          6820
      N=N-1                                                             6830
      IF(N.NE.0) GO TO 221                                              6840
  220 IF(N.EQ.0)  GO TO 230                                             6850
      M=N+2                                                             6860
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(3,2,1)                              6870
      WRITE (IGRU) IE,GMAT,GTYP(I),KENNZ(1,I),M,NT,N,(F(J),J=1,N)       6880
      IF(N.LE.5)  GO TO 91                                              6890
      WRITE (6,52) IE,GMAT,GTYP(I),KENNZ(1,I),M,NT,N,(F(J),J=1,N)       6900
      GO TO 222                                                         6910
   91 WRITE(6,92)  IE,GMAT,GTYP(I),KENNZ(1,I),M,NT,N,(F(J),J=1,N)       6920
      GO TO 222                                                         6930
  230 N=1                                                               6940
      IF(IV.EQ.0)  KENNZ(2,I)=NVARB(3,2,2)                              6950
      WRITE(IGRU) IE,GMAT,GTYP(I),KENNZ(2,I),N,F(1)                     6960
      WRITE(6,50) IE,GMAT,GTYP(I),KENNZ(2,I),N,F(1)                     6970
      GO TO 222                                                         6980
C                                                                       6990
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 4             7000
C                                                                       7010
  300 READ (MIG)J,(FELD(K),K=1,J)                                       7020
      IF(J.NE.0) GO TO 301                                              7030
      BACKSPACE MIG                                                     7040
      GO TO 27                                                          7050
  301 IF=IZG-IFELD(1)                                                   7060
      READ (MIG) J,(FELD(K),K=1,J)                                      7070
      IF(LWORT(1).NE.MMAT) GO TO 27                                     7080
      IF(LWORT(2).EQ.MTYP(I)) GO TO 302                                 7090
      READ(MIG) J,(FELD(K),K=1,J)                                       7100
      GO TO 300                                                         7110
  302 READ (MIG) J,(FELD(K),K=1,J)                                      7120
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(4,1,1)                              7130
      M=1                                                               7140
      IB=IOGRUP                                                         7150
      DO 303 K=MUGRUP,MOGRUP                                            7160
      IF(IF.GT.J) GO TO 26                                              7170
      WRITE (IGRU) IB,GMAT,GTYP(I),KENNZ(1,I),M,FELD(IF)                7180
      WRITE (6,50) IB,GMAT,GTYP(I),KENNZ(1,I),M,FELD(IF)                7190
      IB=IB-1                                                           7200
  303 IF=IF+1                                                           7210
      GO TO 26                                                          7220
C                                                                       7230
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 5             7240
C                                                                       7250
  400 READ(MIG)J,(FELD(K),K=1,J)                                        7260
      IF(J.NE.0) GO TO 401                                              7270
  402 BACKSPACE MIG                                                     7280
      GO TO 27                                                          7290
  401 IF(LWORT(1).NE.MMAT) GO TO 27                                     7300
      IF=IFELD(3)                                                       7310
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(5,1,1)                              7320
      DO 404 L=1,IF                                                     7330
      READ (MIG)J,(FELD(K),K=1,J)                                       7340
      IF(J.NE.0) GO TO 405                                              7350
      GO TO 402                                                         7360
  405 IF(IFELD(1).LT.MOG) GO TO 27                                      7370
      IF(IFELD(1).GT.MOG) GO TO 404                                     7380
      IB=2                                                              7390
      IS=IE                                                             7400
      M=J                                                               7410
      DO 406 N=2,J                                                      7420
      IF(FELD(N).NE.0)  GO TO 407                                       7430
      IS=IS+1                                                           7440
      M=M-1                                                             7450
  406 IB=IB+1                                                           7460
      IB=IB-1                                                           7470
      IS=IS-1                                                           7480
      M=M+1                                                             7490
  407 WRITE(IGRU)IE,GMAT,GTYP(I),KENNZ(1,I),M,IS,(FELD(K),K=IB,J)       7500
      IF(J-IB+1.LE.5)  GO TO 89                                         7510
      WRITE(6,51)IE,GMAT,GTYP(I),KENNZ(1,I),M,IS,(FELD(K),K=IB,J)       7520
      GO TO 90                                                          7530
   89 WRITE(6,82)IE,GMAT,GTYP(I),KENNZ(1,I),M,IS,(FELD(K),K=IE,J)       7540
   90 IE=IE-1                                                           7550
      MOG=MOG-1                                                         7560
      IF(MOG.LT.MUGRUP) GO TO 26                                        7570
  404 CONTINUE                                                          7580
      GO TO 26                                                          7590
C                                                                       7600
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 6             7610
C                                                                       7620
  500 READ(MIG)J,(FELD(K),K=1,J)                                        7630
      IF(J.NE.0) GO TO 501                                              7640
      BACKSPACE MIG                                                     7650
      GO TO 27                                                          7660
  501 IF(LWORT(1).NE.MMAT) GO TO 27                                     7670
      IGG=IFELD(3)                                                      7680
      IF=IFELD(4)                                                       7690
      DO 502 L=1,2                                                      7700
      IF(FLUM(L).EQ.MTYP(I)) GO TO 503                                  7710
  502 CONTINUE                                                          7720
      GO TO 504                                                         7730
  503 IF(IV.EQ.0)  KENNZ(1,I)=NVARB(6,1,1)                              7740
      DO 505 N=1,IGG                                                    7750
      READ(MIG)J,(FELD(K),K=1,J)                                        7760
      IF(IFELD(1).LT.IZ) GO TO 505                                      7770
      IF(IFELD(1).GT.IZ) GO TO 27                                       7780
      M=1                                                               7790
      WRITE (IGRU)IG,GMAT,GTYP(I),KENNZ(1,I),M,FELD(L+1)                7800
      WRITE (6,50)IG,GMAT,GTYP(I),KENNZ(1,I),M,FELD(L+1)                7810
      IG=IG+1                                                           7820
      IZ=IZ+1                                                           7830
      IF(IZ.GT.MOGRUP) GO TO 26                                         7840
```

```
  505 CONTINUE                                                          7850
      GO TO 26                                                          7860
C                                                                       7870
  504 DO 506 L=1,IGG                                                    7880
  506 READ(MIG) J,(FELD(K),K=1,J)                                       7890
      LWORT(1)=FLUM(3)                                                  7900
      LWORT(2)=MTYP(I)                                                  7910
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(6,2,1)                              7920
      IF(IFELD(1).NE.IFELD(3)) GO TO 217                                7930
      DO 512 L=1,6                                                      7940
      IF(IFELD(4).EQ.MCM(L))  GO TO 513                                 7950
  512 CONTINUE                                                          7960
  515 WRITE(NOUT,514) MTYP(I)                                           7970
  514 FORMAT(' DER TYPNAME',A10,' IST NICHT ZULAESSIG')                 7980
      GO TO 26                                                          7990
  513 IB=L-1                                                            8000
      IF(IB.GT.0) GO TO 509                                             8010
      GO TO 510                                                         8020
  509 IF(IB+1.GT.IF) GO TO 27                                           8030
      DO 511 L=1,IB                                                     8040
      DO 511 K=1,IGG                                                    8050
  511 READ(MIG)                                                         8060
  510 DO 507 L=1,IGG                                                    8070
      READ(MIG)J,(FELD(K),K=1,J)                                        8080
      IF(IFELD(2).LT.IZ) GO TO 507                                      8090
      IF(IFELD(2).GT.IZ) GO TO 27                                       8100
      M=J-1                                                             8110
      WRITE (IGRU) IG,GMAT,GTYP(I),KENNZ(1,I),M,IG,(FELD(K),K=3,J)      8120
      IF(J-2.LE.5)  GO TO 83                                            8130
      WRITE (6,51) IG,GMAT,GTYP(I),KENNZ(1,I),M,IG,(FELD(K),K=3,J)      8140
   51 FORMAT(I8,2A10,3I5,5E16.8/(43X,5E16.8))                           8150
      GO TO 84                                                          8160
   83 WRITE(6,82)  IG,GMAT,GTYP(I),KENNZ(1,I),M,IG,(FELD(K),K=3,J)      8170
   82 FORMAT(I8,2A10,3I5,5E16.8)                                        8180
   84 IG=IG+1                                                           8190
      IZ=IZ+1                                                           8200
      IF(IZ.GT.MOGRUP) GO TO 26                                         8210
  507 CONTINUE                                                          8220
      GO TO 26                                                          8230
C                                                                       8240
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 7             8250
C                                                                       8260
  600 READ(MIG)J,(FELD(K),K=1,J)                                        8270
      IF(J.NE.0) GO TO 601                                              8280
  605 BACKSPACE MIG                                                     8290
      GO TO 27                                                          8300
  601 IF(LWORT(1).NE.MMAT) GO TO 27                                     8310
      IB=IFELD(5)                                                       8320
      LWORT(1)=MTYP(I)                                                  8330
      IF=IFELD(2)*2                                                     8340
      IF(IF.GT.0) GO TO 602                                             8350
      GO TO 603                                                         8360
  602 DO 604 K=1,IF                                                     8370
      READ(MIG) J                                                       8380
      IF(J.EQ.0) GO TO 605                                              8390
  604 CONTINUE                                                          8400
  603 READ(MIG) J,(FELD(K),K=1,J)                                       8410
      IF(J.EQ.0) GO TO 605                                              8420
      M=1                                                               8430
      IF=IB-MOGRUP+1                                                    8440
      IF(IF.GT.J)  GO TO 26                                             8450
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(7,1,1)                              8460
  606 WRITE (IGRU) IE,GMAT,GTYP(I),KENNZ(1,I),M,FELD(IF)                8470
      WRITE (6,50) IE,GMAT,GTYP(I),KENNZ(1,I),M,FELD(IF)                8480
      IF=IF+1                                                           8490
      IF(IF.GT.J) GO TO 26                                              8500
      MOG=MOG-1                                                         8510
      IE=IE-1                                                           8520
      IF(MOG.GE.MUGRUP) GO TO 606                                       8530
      GO TO 26                                                          8540
C                                                                       8550
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 8             8560
C                                                                       8570
  700 READ (MIG)J,(FELD(K),K=1,J)                                       8580
      IF(J.NE.0) GO TO 701                                              8590
      BACKSPACE MIG                                                     8600
      GO TO 27                                                          8610
  701 IG=J                                                              8620
      M=1                                                               8630
      IF=IG-MOGRUP+1                                                    8640
      IF(IF.GT.J)  GO TO 26                                             8650
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(8,1,1)                              8660
  702 WRITE (IGRU) IE,GMAT,GTYP(I),KENNZ(1,I),M,FELD(IF)                8670
      WRITE (6,50) IE,GMAT,GTYP(I),KENNZ(1,I),M,FELD(IF)                8680
      IF=IF+1                                                           8690
      IF(IF.GT.J) GO TO 26                                              8700
      IE=IE-1                                                           8710
      MOG=MOG-1                                                         8720
      IF(MOG.GE.MUGRUP) GO TO 702                                       8730
      GO TO 26                                                          8740
C                                                                       8750
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 9             8760
C                                                                       8770
  800 READ(MIG)J,(FELD(K),K=1,J)                                        8780
      IF(J.NE.0) GO TO 801                                              8790
      BACKSPACE MIG                                                     8800
      GO TO 27                                                          8810
  801 IF(LWORT(1).NE.MMAT) GO TO 27                                     8820
      IF=IFELD(4)                                                       8830
  804 READ(MIG)J,(FELD(K),K=1,J)                                        8840
      IF(J.NE.IFELD(2)*IFELD(3)*4+3) GO TO 27                           8850
      IB=IFELD(2)                                                       8860
      IPK=IFELD(3)                                                      8870
      IF(IFELD(1).EQ.MOG) GO TO 802                                     8880
  808 DO 803 M=1,IF                                                     8890
  803 READ (MIG)J,(FELD(K),K=1,J)                                       8900
      GO TO 804                                                         8910
  802 DO 805 M=1,4                                                      8920
      IF(MTYP(I).EQ.REMO(M)) GO TO 806                                  8930
  805 CONTINUE                                                          8940
      GO TO 807                                                         8950
  806 MI=IB*IPK                                                         8960
```

```
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(9,1,1)
      L=MI*(M-1)+4
      N=L+MI-1
      WRITE (IGRU) IE,GMAT,GTYP(I),KENNZ(1,I),MI,(FELD(K),K=L,N)
      IF(N-L+1.LE.5)  GO TO 86
      WRITE (6,50) IE,GMAT,GTYP(I),KENNZ(1,I),MI,(FELD(K),K=L,N)
      GO TO 87
   86 WRITE(6,88)  IE,GMAT,GTYP(I),KENNZ(1,I),MI,(FELD(K),K=L,N)
   87 IE=IE-1
      MOG=MOG-1
      IF(MOG.GE.MUGRUP) GO TO 808
      GO TO 26
C
  807 LWORT(1)=MTYP(I)
      LWORT(2)=REMO(5)
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(9,2,1)
      IF(IFELD(1).NE.IFELD(3)) GO TO 27
      DO 812 L=1,6
      IF(IFELD(2).EQ.MOM(L))  GO TO 813
  812 CONTINUE
      GO TO 515
  813 L=L-1
      N=1
  810 READ(MIG)J,(FELD(K),K=1,J)
      IF(IFELD(1).EQ.L)  GO TO 809
      N=N+1
      IF(N.LE.IF) GO TO 810
      GO TO 27
  809 M=J-1
      WRITE (IGRU)IE,GMAT,GTYP(I),KENNZ(1,I),M,IE,(FELD(K),K=3,J)
      IF(J-2.LE.5)  GO TO 85
      WRITE (6,51)IE,GMAT,GTYP(I),KENNZ(1,I),M,IE,(FELD(K),K=3,J)
      GO TO 95
   85 WRITE (6,82)IE,GMAT,GTYP(I),KENNZ(1,I),M,IE,(FELD(K),K=3,J)
   95 IE=IE-1
      MOG=MOG-1
      IF(MOG.LT.MUGRUP)  GO TO 26
      N=IF-L-1
      IF(N.EQ.0)  GO TO 804
      DO 811 M=1,N
  811 READ(MIG)
      GO TO 804
C
C     VERARBEITUNG DER AUSGABE DES MIGROS - PROGRAMMS NR. 10
C
  900 READ(MIG)J,(FELD(K),K=1,J)
      IF(J.NE.0) GO TO 901
      BACKSPACE MIG
      GO TO 27
  901 IF(LWORT(1).NE.MMAT) GO TO 27
      IF(LWORT(2).EQ.MTYP(I)) GO TO 902
      READ(MIG)J,(FELD(K),K=1,J)
      GO TO 900
  902 READ(MIG)J,(FELD(K),K=1,J)
      IF(IV.EQ.0)  KENNZ(1,I)=NVARB(10,1,1)
      M=1
```

```
      WRITE (IGRU) NTHERM,GMAT,GTYP(I),KENNZ(1,I),M,FELD(1)
      WRITE (6,50) NTHERM,GMAT,GTYP(I),KENNZ(1,I),M,FELD(1)
C
   26 CONTINUE
      WRITE(NOUT,65)
   65 FORMAT(/' ***ENDE DES PROTOKOLLS DER WERTE, DIE NEU AUF GRUBA AUFG
     1ENOMMEN WERDEN')
      GO TO 999
C
 1000 STOP
      END
```

```
      INTEGER FUNCTION NFXFL(I)
      EQUIVALENCE (N,X)
      N=I
      IF(N.GT.10000)  N=IFIX(X+0.001)
      NFXFL=N
      RETURN
      END
```

```
      SUBROUTINE TEST1 (MAT,TYP,LAB,FSTAT,MOGRUP,NOUT,FF,LT,NS,MI,SIGO,T
     1,IREN,TEXT,ATXT,IPS)
      REAL*8 MAT,TYP,LAB,FSTAT(5),LB(2),BTXT(5)
      DIMENSION SIGO(10),FF(10,100,7),T(10),SIG(7),IPS(100),IREN(100),
     1TEXT(5),ATXT(5)
      DATA SIG/0.,10.,100.,1.E3,1.E4,1.E5,1.E6/,LB/'MIGR    ','FSTAT   '
     1/
      DO 1 I=1,2
      IF(LAB.EQ.LB(I)) GO TO 2
    1 CONTINUE
      WRITE (NOUT,3) LAB
    3 FORMAT(1HO/' DAS TESTPROGRAMM TEST1 IST FUER DEN LABEL',A9,' UNGEE
     1IGNET')
      GO TO 100
    2 IF(LT.EQ.3)  GO TO 66
      GO TO 67
   66 T1=SQRT((T(2)*T(3))/T(1))
      T2=SQRT((T(3)*T(1))/T(2))
      T3=SQRT((T(1)*T(2))/T(3))
      T4=SQRT(T(1))
      T5=SQRT(T(2))
      T6=SQRT(T(3))
      TREF=3500.
      TO=0.999994E9
C
C     UEBERPRUEFUNG AUF STANDARD SIGMA0
C
   67 IF(NS.NE.7)  GO TO 4
      DO 5 I=1,7
      IF(SIG(I).NE.SIGO(I))  GO TO 4
    5 CONTINUE
      GO TO 44
    4 WRITE (NOUT,7) LAB,(SIG(I),I=1,7)
```

```
    7 FORMAT(1HO/' TEST1 : IN LABEL',A9,' SIND DIE SIGMAO - WERTE NICHT
     1GLEICH DEN STANDARD - WERTEN'/9X,7E16.8)
      GO TO 102
C
C     UEBERPRUEFUNG AUF 0.LT.F.LE.1
C
   44 DO 35 J=1,MI
      DO 37 K=1,LT
      DO 37 L=1,NS
      IF(FF(K,J,L).LE.0)  GO TO 36
      IF(FF(K,J,L).GT.1.) GO TO 39
   37 CONTINUE
      GO TO 35
   36 M=MOGRUP-J+1
      WRITE (NOUT,38) LAB,MAT,M,TYP
   38 FORMAT(1HO/' TEST1 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SI
     1ND DIE RENORMIERTEN F-FAKTOREN',A9,' KLEINER 0')
      IPS(J)=1
      GO TO 35
   39 M=MOGRUP-J+1
      IF(IREN(J).EQ.1)  GO TO 45
      WRITE(NOUT,40) LAB,MAT,M,(ATXT(I),I=1,5),TYP
      GO TO 46
   45 WRITE (NOUT,40) LAB,MAT,M,(TEXT(I),I=1,5),TYP
   40 FORMAT(1HO/' TEST1 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SI
     1ND DIE ',5A4,' F-FAKTOREN',A9,' GROESSER 1')
   46 IPS(J)=1
   35 CONTINUE
C
C     UEBERPRUEFUNG DER MONOTONIE MIT STEIGENDER TEMPERATUR
C
    6 IF(LT.EQ.3.AND.T(1).EQ.300..AND.T(2).EQ.900..AND.T(3).EQ.2100.)
     1GO TO 8
      WRITE (NOUT,9) LAB,MAT,TYP
    9 FORMAT(1HO/' TEST1 : IN LABEL',A9,' MATERIAL',A9,' KANN DER F-FAKT
     1OR',A9/9X,'NICHT AUF STEIGENDE MONOTONIE FUER STEIGENDE TEMPERATUR
     2EN GEPRUEFT WERDEN'/9X,'WEIL IN MIGROS-2 NICHT MIT DEN STANDARD -
     3TEMPERATUREN 300, 900, 2100 GRAD KELVIN GERECHNET WURDE')
      GO TO 10
    8 DO 11 J=1,MI
      M=MOGRUP-J+1
      IF(IREN(J).EQ.1)  GO TO 58
      DO 59 L=1,5
   59 BTXT(L)=ATXT(L)
      GO TO 60
   58 DO 61 L=1,5
   61 BTXT(L)=TEXT(L)
   60 DO 11 L=1,NS
      DO 12 K=2,LT
      IF(FF(K,J,L).LT.FF(K-1,J,L)) GO TO 13
   12 CONTINUE
      INDEX=0
      GO TO 50
   13 INDEX=1
   47 WRITE (NOUT,14) LAB,MAT,M,SIGO(L),(BTXT(I),I=1,5),TYP
   14 FORMAT(1HO/' TEST1 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SI
     1GMAO =',E16.8/8X,' SIND DIE ',5A4,' F-FAKTOREN',A9,' NICHT MONOTON
     2 STEIGEND MIT STEIGENDER TEMPERATUR')
   48 DO 15 K=2,LT
      IF(FF(K,J,L).GT.FF(K-1,J,L)) GO TO 51
   15 CONTINUE
   49 WRITE (NOUT,17) (BTXT(I),I=1,5)
   17 FORMAT(' TEST1 : DIE ',5A4,' F-FAKTOREN SIND MONOTON FALLEND MIT S
     1TEIGENDER TEMPERATUR')
   50 A1=T4          *(FF(2,J,L)-FF(3,J,L))
      A2=T5          *(FF(3,J,L)-FF(1,J,L))
      A3=T6          *(FF(1,J,L)-FF(2,J,L))
      A=A1+A2+A3
      B1=FF(1,J,L)*A1
      B2=FF(2,J,L)*A2
      B3=FF(3,J,L)*A3
      IF(A.NE.0)  GO TO 80
      CC=0
      C1=FF(1,J,L)
      C2=0
      GO TO 79
   80 CC=(B1*T1+B2*T2+B3*T3)/A
      C1=(B1+B2+B3)/A
      C2=(A1*T1+A2*T2+A3*T3)/A
   79 IF(CC*C1.GE.0)  GO TO 68
      TZ=(CC*CC)/(C1*C1)
      GO TO 69
   68 TZ=TC
   69 IF(C2.GE.0)  GO TO 70
      TN=C2*C2
      GO TO 71
   70 TN=TC
   71 IF(INDEX.EQ.0)  GO TO 72
   75 WRITE(NOUT,74)
   74 FORMAT (/4X,'SIGMAO',9X,'CC',11X,'C1',11X,'C2',8X,'TZAEHLER',6X,
     1'TNENNER',10X,'F1',14X,'F2',14X,'F3')
      WRITE (NOUT,18) SIGO(L),CC,C1,C2,TZ,TN,FF(1,J,L),FF(2,J,L),
     1FF(3,J,L)
   18 FORMAT(6E13.5,3E16.8)
      GO TO 20
   51 WRITE (NOUT,19)LAB,MAT,M,SIGO(L),(BTXT(I),I=1,5),TYP,FF(1,J,L),
     1FF(2,J,L),FF(3,J,L)
   19 FORMAT(' TEST1 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SIGMAO
     1 =',E16.8/9X,'SIND DIE ',5A4,' F-FAKTOREN',A9,' NICHT MONOTON FALL
     2END MIT STEIGENDER TEMPERATUR'/60X,'F1 =',E16.8,' F2 =',E16.8,
     3' F3 =',E16.8)
      GO TO 50
   72 IF(CO.LE.0.AND.C1.LE.0.ANC.C2.GE.0)  GO TO 76
      IF(CO.GT.0.AND.C1.GE.0.AND.C2.GE.0)  GC TO 11
      IF(CO.GE.0.AND.C1.GT.0.AND.C2.GE.0)  GC TO 11
      IF(CO.LT.0.AND.C1.LE.0.AND.C2.LT.0.AND.TN.GE.TREF)  GO TO 11
      IF(CO.LE.0.AND.C1.LT.0.AND.C2.LT.0.AND.TN.GE.TREF)  GO TC 11
      IF(CO.GT.0.AND.C2.GE.0.AND.TZ.GE.TREF)  GO TO 11
      IF(CO.LT.0.AND.C2.LT.0.AND.TZ.GE.TREF.AND.TN.GE.TREF)  GO TO 11
      WRITE(NOUT,73)LAB,MAT,M, SIGO(L),(BTXT(I),I=1,5),TYP
   73 FORMAT(//' TEST1 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SIGM
     1AO =',E16.8/9X,'KOENNEN BEI DER TEMPERATURINTERPOLATION DER',5A4,
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     2' F-FAKTOREN',A9,' ZWISCHEN 0 UND 3500 GRAD KELVIN'/9X,'SCHWIERIGK 1460
     3EITEN AUFTRETEN')                                                  1470
      GO TO 75                                                           1480
   76 WRITE(NOUT,77) LAB,MAT,M,SIGO(L),(BTXT(I),I=1,5),TYP               1490
   77 FORMAT(//' TEST1 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SIGM 1500
     1AO =',E16.8/9X,'KANN BEI DER TEMPERATURINTERPOLATION DER',5A4,      1510
     2' F-FAKTOREN',A9/9X,'DIE 3-PUNKTFORMEL NICHT SINNVOLL VERWENDET WE 1520
     3RDEN')                                                             1530
      GO TO 75                                                           1540
   20 IPS(J)=1                                                           1550
   11 CONTINUE                                                           1560
C                                                                        1570
C     UEBERPRUEFUNG DER MONOTONIE MIT STEIGENDEM SIGMAO                  1580
C                                                                        1590
   10 N=0                                                                1600
      DO 21 J=1,MI                                                       1610
      M=MOGRUP-J+1                                                       1620
      IF(IREN(J).EQ.1)  GO TO 62                                         1630
      DO 63 L=1,5                                                        1640
   63 BTXT(L)=ATXT(L)                                                    1650
      GO TO 64                                                           1660
   62 DO 65 L=1,5                                                        1670
   65 BTXT(L)=TEXT(L)                                                    1680
   64 DO 21 K=1,LT                                                       1690
      DO 22 L=2,NS                                                       1700
      IF(FF(K,J,L).LT.FF(K,J,L-1)) GO TO 23                              1710
   22 CONTINUE                                                           1720
      GO TO 21                                                           1730
   23 IF(N.EQ.0)  WRITE(NOUT,57)                                         1740
   57 FORMAT(1HO//)                                                      1750
   52 WRITE (NOUT,25) LAB,MAT,T(K),M,(BTXT(I),I=1,5),TYP                 1760
   25 FORMAT(1HO/' TEST1 : IN LABEL',A9,' MATERIAL',A9,' TEMPERATUR',    1770
     1F10.2,' GRUPPE',I5/9X,'SIND DIE ',5A4,' F-FAKTOREN',A9,' NICHT MON 1780
     2OTON STEIGEND MIT STEIGENDEM SIGMAO')                              1790
   53 N=1                                                                1800
      DO 26 L=2,NS                                                       1810
      IF(FF(K,J,L).GT.FF(K,J,L-1)) GO TO 56                              1820
   26 CONTINUE                                                           1830
   54 WRITE (NOUT,27) (BTXT(I),I=1,5)                                    1840
   27 FORMAT(' TEST1 : DIE ',5A4,' F-FAKTOREN SIND MONOTON FALLEND MIT S 1850
     1TEIGENDEM SIGMAO'//6X,'SIGO1',11X,'SIGO2',13X,'A',15X,'B',15X,'F1' 1860
     2,14X,'F2')                                                         1870
   55 F1=FF(K,J,1)*FF(K,J,1)                                             1880
      DO 28 I=2,7                                                        1890
      F2=FF(K,J,I)*FF(K,J,I)                                             1900
      IF(F1.NE.F2)  GO TO 29                                             1910
      A=0.                                                               1920
      B=0.                                                               1930
      GO TO 30                                                           1940
   29 IF(FF(K,J,I-1).EQ.1..AND.FF(K,J,I).NE.1.)  GO TO 31                1950
      IF(FF(K,J,I-1).NE.1..AND.FF(K,J,I).EQ.1.)  GO TO 32                1960
      B=(SIGO(I-1)*(1.-F1)-SIGO(I)*(1.-F2))/(F1-F2)                      1970
      A=F1*B-SIGO(I-1)*(1.-F1)                                           1980
      GO TO 30                                                           1990
   31 B=(SIGO(I)*(1.-F2)+10.)/F2                                         2000
      A=10.                                                              2010
      GO TO 30                                                           2020
   32 B=(SIGO(I-1)*(1.-F1)+10.)/F1                                       2030
      A=10.                                                              2040
   30 WRITE (NOUT,33) SIGO(I-1),SIGO(I),A,B,FF(K,J,I-1),FF(K,J,I)        2050
   33 FORMAT(6E16.8)                                                     2060
   28 F1=F2                                                              2070
      GO TO 43                                                           2080
   56 WRITE(NOUT,42) LAB,MAT,T(K),M,(BTXT(I),I=1,5),TYP                  2090
   42 FORMAT(' TEST1 : IN LABEL',A9,' MATERIAL',A9,' TEMPERATUR',F10.2,  2100
     1' GRUPPE',I5/9X,' SIND DIE ',5A4,' F-FAKTOREN',A9,' NICHT MONOTON  2110
     2FALLEND MIT STEIGENDEM SIGMAO')                                    2120
   43 IPS(J)=1                                                           2130
   21 CONTINUE                                                           2140
      GO TO 100                                                          2150
  102 DO 34 J=1,MI                                                       2160
   34 IPS(J)=1                                                           2170
  100 WRITE (NOUT,200) MAT,TYP,LAB                                       2180
  200 FORMAT('    ENDE VON TEST1 FUER MATERIAL',A9,' TYP',A9,' LABEL',A9 2190
     1)                                                                  2200
      RETURN                                                             2210
      END                                                                2220
```

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      SUBROUTINE TEST3 (MAT,TYP,LAB,MOGRUP,MUGRUP,ISPA,IGSATZ,MIG,NOUT,    10
     1FSTRUK,GSTRUK,      FELD,IFELD,LWORT,KK)                             20
C                                                                          30
C     DIESE SUBROUTINE PRUEFT DIE MIGROS - AUSGABE DES PROGRAMMS 3         40
C                                                                          50
      REAL*8 MAT,TYP,LAB,FSTRUK(5),GSTRUK(6),LB,LWORT(2),END               60
      DIMENSION FELD(2000),SIGO(10),SIG(7),F(10),IFELD(2000),KK(500)       70
      DATA LB/'STRK    '/,END/'ENDE    '/,                                 80
     1SIG/0.,10.,100.,1.E3,1.E4,1.E5,1.E6/                                 90
      IF(LAB.EQ.LB)    GO TO 2                                            100
      WRITE(NOUT,3) LAB                                                  110
    3 FORMAT(1HO/' DAS TESTPROGRAMM TEST3 IST FUER DEN LABEL',A9,' UNGEE 120
     1IGNET')                                                            130
      GO TO 100                                                          140
    2 REWIND MIG                                                         150
      NT=1                                                               160
      MOG=IGSATZ-MOGRUP                                                  170
    4 READ (MIG) J,(FELD(K),K=1,J)                                       180
      IF(J.NE.0) GO TO 4                                                 190
    9 BACKSPACE MIG                                                      200
      READ(MIG)J,(FELD(K),K=1,2)                                         210
      IF(LWORT(1).EQ.END) GO TO 99                                       220
      IF(LWORT(1).NE.LAB) GO TO 4                                        230
      READ (MIG) J,(FELD(K),K=1,J)                                       240
      IF(LWORT(1).NE.MAT) GO TO 4                                        250
   10 NG=IFELD(3)                                                        260
      IF(ISPA.EQ.1) GO TO 15                                             270
      DO 16 M=1,5                                                        280
      IF(TYP.EQ.FSTRUK(M)) GO TO 6                                       290
   16 CONTINUE                                                           300
```

```
      GO TO 50                                                          310
   15 DO 17 M=1,6                                                       320
      IF(TYP.EQ.GSTRUK(M)) GO TO 6                                      330
   17 CONTINUE                                                          340
   50 WRITE(NOUT,14) LAB,TYP                                            350
   14 FORMAT(1HO/' TEST3 : IN LABEL',A9,' IST DER TYP',A9,' NICHT ENTHAL 360
     1TEN')                                                             370
      GO TO 101                                                         380
    6 IF(NG.LT.MOG)  GO TO 7                                            390
      IF(NG.EQ.MOG)  GO TO 8                                            400
      GO TO 4                                                           410
    7 READ (MIG) J,(FELD(K),K=1,J)                                      420
      IF(J.EQ.0) GO TO 32                                               430
      IF(LWORT(1).NE.MAT) GO TO 7                                       440
      GO TO 10                                                          450
   32 GO TO (9,100),NT                                                  460
    8 READ (MIG) J,(FELD(K),K=1,J)                                      470
      N=0                                                               480
   12 READ (MIG) J,(FELD(K),K=1,J)                                      490
      IF(J.EQ.0) GO TO 11                                               500
      IF(LWORT(1).EQ.MAT) GO TO 11                                      510
      N=N+1                                                             520
      SIGO(N)=FELD(1)                                                   530
      F(N)=FELD(M+1)                                                    540
      GO TO 12                                                          550
C                                                                       560
C     UEBERPRUEFUNG AUF STANDARD SIGMAO                                 570
C                                                                       580
   11 IF(N.NE.7) GO TO 18                                               590
      DO 19 I=1,7                                                       600
      IF(SIGO(I).NE.SIG(I)) GO TO 18                                    610
   19 CONTINUE                                                          620
C                                                                       630
C     UEBERPRUEFUNG AUF 0.LT.F.LE.1                                     640
C     UND AUF MONOTONIE MIT STEIGENDEM SIGMAO                           650
C                                                                       660
      DO 33 I=1,7                                                       670
      IF(F(I).LE.0.99999)  GO TO 33                                     680
      IF(F(I).LE.1.0001)  F(I)=1.                                       690
   33 CONTINUE                                                          700
      DO 20 I=2,7                                                       710
      IF(F(I).LT.F(I-1)) GO TO 21                                       720
   20 CONTINUE                                                          730
      DO 22 I=1,7                                                       740
      IF(F(I).LE.0)  GO TO 34                                           750
      IF(F(I).GT.1.) GO TO 23                                           760
   22 CONTINUE                                                          770
      GO TO 24                                                          780
   18 WRITE (NOUT,25) LAB,(SIG(I),I=1,7)                                790
   25 FORMAT(1HO/' TEST3 : IN LABEL',A9,' SIND DIE SIGMAO - WERTE NICHT 800
     1GLEICH DEN STANDARD - WERTEN'/9X,7E16.8)                          810
      GO TO 102                                                         820
   21 MO=IGSATZ-MOG                                                     830
      WRITE (NOUT,26) LAB,MAT,MO, TYP                                   840
   26 FORMAT(1HO/' TEST3 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SI 850
     1ND DIE F-FAKTOREN',A9,' NICHT MONOTON STEIGEND MIT STEIGENDEM SIGM 860
     2AO')                                                              870
      DO 36 I=2,7                                                       880
      IF(F(I).GT.F(I-1))  GO TO 37                                      890
   36 CONTINUE                                                          900
      WRITE(NOUT,41)                                                    910
   41 FORMAT(' TEST3 : DIE F-FAKTOREN SIND MONOTON FALLEND MIT STEIGENDE 920
     1M SIGMAO'//6X,'SIG01',11X,'SIG02',13X,'A',15X,'B',15X,'F1',14X,'F2 930
     2')                                                                940
      F1=F(1)*F(1)                                                      950
      DO 38 I=2,7                                                       960
      F2=F(I)*F(I)                                                      970
      IF(F1.NE.F2)  GO TO 43                                            980
      A=0.                                                              990
      B=0.                                                             1000
      GO TO 44                                                         1010
   43 IF(F(I-1).EQ.1..AND.F(I).NE.1.)  GO TO 45                        1020
      IF(F(I-1).NE.1..AND.F(I).EQ.1.)  GO TO 46                        1030
      B=(SIGO(I-1)*(1.-F1)-SIGO(I)*(1.-F2))/(F1-F2)                    1040
      A=F1*B-SIGO(I-1)*(1.-F1)                                         1050
      GO TO 44                                                         1060
   45 B=(SIGO(I)*(1.-F2)+10.)/F2                                       1070
      A=10.                                                            1080
      GO TO 44                                                         1090
   46 B=(SIGO(I-1)*(1.-F1)+10.)/F1                                     1100
      A=10.                                                            1110
   44 WRITE(NOUT,39) SIGO(I-1),SIGO(I),A,B,F(I-1),F(I)                 1120
   39 FORMAT(6E16.8)                                                   1130
   38 F1=F2                                                            1140
      GO TO 102                                                        1150
   37 MO=IGSATZ-MOG                                                    1160
      WRITE(NOUT,40)LAB,MAT,MO,TYP                                     1170
   40 FORMAT(' TEST3 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SIND D 1180
     1IE F-FAKTOREN',A9,' NICHT MONOTON FALLEND MIT STEIGENDEM SIGMAO')  1190
      GO TO 102                                                        1200
   34 MO=IGSATZ-MOG                                                    1210
      WRITE(NOUT,35) LAB,MAT,MO,TYP                                    1220
   35 FORMAT(1HO/' TEST3 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' IS 1230
     1T MINDESTENS EIN F-FAKTOR',A9,' KLEINER 0')                       1240
      GO TO 102                                                        1250
   23 MO=IGSATZ-MOG                                                    1260
      WRITE (NOUT,27) LAB,MAT,MO,TYP                                   1270
   27 FORMAT(1HO/' TEST3 : IN LABEL',A9,' MATERIAL',A9,' GRUPPE',I5,' SI 1280
     1ND DIE F-FAKTOREN',A9,' GROESSER 1')                              1290
  102 KK(IGSATZ-MOG)=1                                                 1300
   24 MOG=MOG+1                                                        1310
      IF(MOG.LE.IGSATZ-MUGRUP) GO TO    8                            1320
      GO TO 100                                                        1330
   99 I=IGSATZ-MOG                                                     1340
      WRITE (NOUT,98) I                                                1350
   98 FORMAT(1HO/' TEST3 : DIE MIGROS - GRUPPE',I5,' WURDE IN DER MIGROS 1360
     1 - RECHNUNG NICHT BERUECKSICHTIGT')                               1370
  101 DO 42 I=MUGRUP,MOGRUP                                            1380
   42 KK(I)=1                                                          1390
  100 WRITE(NOUT,200)MAT,TYP,LAB,MOGRUP,MUGRUP                        1400
  200 FORMAT('    ENDE VON TEST3 FUER MATERIAL',A9,' TYP',A9,' LABEL',A9 1410
     1,' IN DEN GRUPPEN',I5,' BIS',I5)                                  1420
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```
      RETURN                                                            1430
      END                                                               1440



      SUBROUTINE TEST5 (MAT,LAB,MOGRUP,MUGRUP,MIG,NOUT,FELD,IFELD,        10
     1LWORT,KK)                                                            20
C                                                                          30
C     DIESE SUBROUTINE PRUEFT DIE MIGROS - AUSGABE DES PROGRAMMS 5         40
C                                                                          50
      REAL*8 MAT,LAB,LB,LWORT(2),END                                       60
      DIMENSION FELD(2000),IFELD(2000)                                     70
      DATA LB/'SMTOT   '/,END/'ENDE    '/                                  80
      IF(LAB.EQ.LB)  GO TO 1                                               90
      WRITE(NOUT,2) LAB                                                   100
    2 FORMAT(1HO/' DAS TESTPROGRAMM TEST5 IST FUER DEN LABEL',A9,' UNGEE  110
     1IGNET')                                                             120
      GO TO 100                                                           130
    1 REWIND MIG                                                          140
    3 READ(MIG) J,(FELD(K),K=1,J)                                         150
      IF(J.NE.0)  GO TO 3                                                 160
      BACKSPACE MIG                                                       170
      READ(MIG) J,(FELD(K),K=1,2)                                         180
      IF(LWORT(1).EQ.END)  GO TO 99                                       190
      IF(LWORT(1).NE.LAB)  GO TO 3                                        200
      READ(MIG) J,(FELD(K),K=1,J)                                         210
      IF(LWORT(1).NE.MAT)  GO TO 3                                        220
      IF=IFELD(3)                                                         230
      MOG=MOGRUP                                                          240
      DO 8 I=1,IF                                                         250
      READ(MIG) J,(FELD(K),K=1,J)                                         260
      IF(IFELD(1).LT.MOG)  GO TO 3                                        270
      IF(IFELD(1).GT.MOG)  GO TO 8                                        280
      S=0.                                                                290
      DO 4 K=2,J                                                          300
    4 S=S+FELD(K)                                                         310
      IF(S*0.9995.LE.1.)  GO TO 5                                         320
    6 WRITE(NOUT,7) LAB,MAT,IFELD(1),S                                    330
    7 FORMAT(1HO/' TEST5 : LABEL',A9,' MATERIAL',A9,' AUSSTREUGRUPPE',I5  340
     1,' DIE SUMME UEBER ALLE EINSTREUGRUPPEN BETRAEGT',E16.8)            350
      GO TO 101                                                           360
    5 IF(S*1.0005.GE.1.)  GO TO 9                                         370
      GO TO 6                                                             380
    9 MOG=MOG-1                                                           390
      IF(MOG.LT.MUGRUP)  GO TO 100                                        400
    8 CONTINUE                                                            410
      GO TO 100                                                           420
   99 WRITE(NOUT,98) LAB,MAT                                              430
   98 FORMAT(1HO/' TEST5 : DER LABEL',A9,' IST NICHT VORHANDEN, ODER DAS  440
     1 MATERIAL',A9/' IST IN DEN GEWUENSCHTEN GRUPPEN IN DIESEM LABEL NI  450
     2CHT ENTHALTEN')                                                     460
  101 KK=1                                                                470
  100 WRITE(NOUT,200)MAT,LAB,MOGRUP,MUGRUP                                480
  200 FORMAT('     ENDE VON TEST5 FUER MATERIAL',A9,' LABEL',A9,' IN DEN  490
     1GRUPPEN',I5,' BIS',I5)                                              500
      RETURN                                                              510
      END                                                                 520



      SUBROUTINE TEST6 (MAT,TYP,LAB,MOGRUP,MUGRUP,MIG,NOUT,FELD,IFELD,    10
     1LWORT,KK)                                                            20
C                                                                          30
C     DIESE SUBROUTINE PRUEFT DIE MIGROS - AUSGABE DES PROGRAMMS 6         40
C                                                                          50
      REAL*8 MAT,TYP,LAB,LB,LWORT(2),END,T                                 60
      DIMENSION FELD(2000),IFELD(2000)                                     70
      DATA LB/'FLUM    '/,END/'ENDE    '/,T/'SGNCO   '/                    80
      IF(LAB.EQ.LB)  GO TO 1                                               90
      WRITE(NOUT,2) LAB                                                   100
    2 FORMAT(1HO/' DAS TESTPROGRAMM TEST6 IST FUER DEN LABEL',A9,' UNGEE  110
     1IGNET')                                                             120
      GO TO 100                                                           130
    1 IF(TYP.EQ.T)  GO TO 3                                               140
      WRITE(NOUT,4) TYP                                                   150
    4 FORMAT(1HO/' DAS TESTPROGRAMM TEST6 IST FUER DEN TYP',A9,' UNGEEIG  160
     1NET')                                                               170
      GO TO 100                                                           180
    3 REWIND MIG                                                          190
    5 READ(MIG) J,(FELD(K),K=1,J)                                         200
      IF(J.NE.0)  GO TO 5                                                 210
      BACKSPACE MIG                                                       220
      READ (MIG) J,(FELD(K),K=1,2)                                        230
      IF(LWORT(1).EQ.END)  GO TO 99                                       240
      IF(LWORT(1).NE.LAB)  GO TO 5                                        250
      READ (MIG) J,(FELD(K),K=1,J)                                        260
      IF(LWORT(1).NE.MAT)  GO TO 5                                        270
      IF=IFELD(3)                                                         280
      DO 6 I=1,IF                                                         290
    6 READ (MIG)                                                          300
      MUG=MUGRUP                                                          310
      DO 9 I=1,IF                                                         320
      READ (MIG) J,(FELD(K),K=1,J)                                        330
      IF(IFELD(1).EQ.0)  GO TO 7                                          340
      WRITE (NOUT,8) LAB,MAT                                              350
    8 FORMAT(1HO/' TEST6 : IM LABEL',A9,' MATERIAL',A9,' WURDE NICHT DAS  360
     1 0. MOMENT GESPEICHERT')                                            370
      GO TO 101                                                           380
    7 IF(IFELD(2).LT.MUG)  GO TO 9                                        390
      IF(IFELD(2).GT.MUG)  GO TO 5                                        400
      S=0.                                                                410
      DO 10 K=3,J                                                         420
   10 S=S+FELD(K)                                                         430
      IF(S*0.9995.LE.1.)  GO TO 11                                        440
   13 WRITE (NOUT,12) LAB,MAT,IFELD(2),S                                  450
   12 FORMAT(1HO/' TEST6 : LABEL',A9,' MATERIAL',A9,' AUSSTREUGRUPPE',I5  460
     1,' DIE SUMME UEBER ALLE EINSTREUGRUPPEN BETRAEGT',E16.8)            470
      GO TO 101                                                           480
```

```
 11 IF(S*1.CC05.GT.1.)  GO TO 14                                        490
    GO TO 13                                                            500
 14 MUG=MUG+1                                                           510
    IF(MUG.GT.MOGRUP)  GO TO 100                                        520
  9 CONTINUE                                                            530
    GO TO 100                                                           540
 99 WRITE (NOUT,98) LAB,MAT                                             550
 98 FORMAT(1HO/' TEST6 : DER LABEL',A9,' IST NICHT VORHANDEN, ODER DAS  560
   1 MATERIAL',A9/' IST IN DEN GEWUENSCHTEN GRUPPEN IN DIESEM LABEL NI  570
   2CHT ENTHALTEN')                                                     580
101 KK=1                                                                590
100 WRITE(NOUT,200)MAT,TYP,LAB,MOGRUP,MUGRUP                           600
200 FORMAT('     ENDE VON TEST6 FUER MATERIAL',A9,' TYP',A9,' LABEL',A9 610
   1,' IN DEN GRUPPEN',I5,' BIS',I5)                                    620
    RETURN                                                              630
    END                                                                 640
```

```
      SUBROUTINE TEST7 (MAT,TYP,LAB,IGSATZ,MIG,NOUT,FELD,IFELD,LWORT,KK)   10
C                                                                          20
C     DIESE SUBROUTINE PRUEFT DIE MIGROS - AUSGABE DES PROGRAMMS 7         30
C                                                                          40
      REAL*8 MAT,TYP,LAB,LB,LWORT(2),END,ATYP                              50
      DIMENSION FELD(2000),IFELD(2000),XTYP(2)                             60
      EQUIVALENCE (ATYP,XTYP(1))                                           70
      DATA LB/'SPALT   '/,END/'ENDE    '/,TP/'CHI '/                       80
      IF(LAB.EQ.LB) GO TO 1                                                90
      WRITE (NOUT,2) LAB                                                  100
    2 FORMAT(1HO/' DAS TESTPROGRAMM TEST7 IST FUER DEN LABEL',A9,' UNGEE  110
     1IGNET')                                                            120
      GO TO 100                                                          130
    1 REWIND MIG                                                         140
    3 READ (MIG) J,(FELD(K),K=1,J)                                       150
      IF(J.NE.0) GO TO 3                                                 160
      BACKSPACE MIG                                                      170
      READ(MIG)J,(FELD(K),K=1,2)                                         180
      IF(LWORT(1).EQ.END) GO TO 99                                       190
      IF(LWORT(1).NE.LAB) GO TO 3                                        200
      READ (MIG) J,(FELD(K),K=1,J)                                       210
      IF(LWORT(1).NE.MAT) GO TO 3                                        220
      IF(IFELD(5)-IFELD(6)+2.NE.IGSATZ)  GO TO 90                        230
      ATYP=TYP                                                           240
      IF(XTYP(1).EQ.TP) GO TO 4                                          250
      WRITE (NOUT,5) LAB,TYP                                             260
    5 FORMAT(1HO/' TEST7 : IN LABEL',A9,' IST DER TYP',A9,' NICHT ENTHAL 270
     1TEN')                                                              280
      GO TO 101                                                          290
    4 IF=XTYP(2)*2                                                       300
      IF(IF.EQ.0) GO TO 6                                                310
      DO 7 I=1,IF                                                        320
      READ (MIG) J                                                       330
      IF(J.EQ.0) GO TO 8                                                 340
    7 CONTINUE                                                           350
```

```
    6 READ (MIG) J,(FELD(K),K=1,J)                                       360
      S=0.                                                               370
      DO 9 K=1,J                                                         380
    9 S=S+FELD(K)                                                        390
      IF(S*C.9995.LE.1.) GO TO 10                                        400
   12 WRITE (NOUT,11) LAB,MAT,TYP,S                                      410
   11 FORMAT(1HO/' TEST7 : LABEL',A9,' MATERIAL',A9,' TYP',A9,' DIE SUMM 420
     1E UEBER ALLE CHI BETRAEGT',E16.8)                                  430
      GO TO 101                                                          440
   10 IF(S*1.CC05.GE.1.) GO TO 100                                       450
      GO TO 12                                                           460
    8 WRITE (NOUT,13) LAB,MAT,TYP                                        470
   13 FORMAT(1HO/' TEST7 : IN LABEL',A9,' MATERIAL',A9,' IST DER TYP',A9 480
     1,' NICHT ENTHALTEN')                                               490
      GO TO 101                                                          500
   99 WRITE(NOUT,98) LAB,MAT                                             510
   98 FORMAT(1HO/' TEST7 : DER LABEL',A9,' IST NICHT VORHANDEN, ODER DAS 520
     1 MATERIAL',A9,' IST IN DIESEM LABEL NICHT ENTHALTEN')              530
      GO TO 101                                                          540
   90 WRITE(NOUT,97) IGSATZ                                              550
   97 FORMAT(1HO/' TEST7 : DAS PRUEFPROGRAMM KANN NICHT BENUTZT WERDEN,  560
     1WEIL IN',9X,'DER MIGROS-RECHNUNG NICHT ALLE MOEGLICHEN',I5,' GRUPP 570
     2EN BERUECKSICHTIGT WURDEN')                                        580
      GO TO 100                                                          590
  101 KK=1                                                               600
  100 WRITE(NOUT,200)MAT,TYP,LAB                                         610
  200 FORMAT('     ENDE VON TEST7 FUER MATERIAL',A9,' TYP',A9,' LABEL',A9 620
     1)                                                                  630
      RETURN                                                             640
      END                                                                650
```

```
      SUBROUTINE TEST9 (MAT,TYP,LAB,MOGRUP,MUGRUP,MIG,NOUT,FELD,IFELD,     10
     1LWORT,KK)                                                           20
C                                                                         30
C     DIESE SUBROUTINE PRUEFT DIE MIGROS - AUSGABE DES PROGRAMMS 9        40
C                                                                         50
      REAL*8 MAT,TYP,LAB,LB,LWORT(2),END,T                                60
      DIMENSION FELD(2000),IFELD(2000)                                    70
      DATA LB/'REMO    '/,END/'ENDE    '/,T/'SCNCO   '/                   80
      IF(LAB.EQ.LB)  GO TO 1                                              90
      WRITE(NOUT,2) LAB                                                  100
    2 FORMAT(1HO/' DAS TESTPROGRAMM TEST9 IST FUER DEN LABEL',A9,' UNGEE 110
     1IGNET')                                                            120
      GO TO 100                                                          130
    1 IF(TYP.EQ.T)  GO TO 3                                              140
      WRITE(NOUT,4) TYP                                                  150
    4 FORMAT(1HO/' DAS TESTPROGRAMM TEST9 IST FUER DEN TYP',A9,' UNGEEIG 160
     1NET')                                                              170
      GO TO 100                                                          180
    3 REWIND MIG                                                         190
    5 READ(MIG) J,(FELD(K),K=1,J)                                        200
      IF(J.NE.0)  GO TO 5                                                210
```

```
      BACKSPACE MIG                                                     220
      READ(MIG) J,(FELD(K),K=1,2)                                       230
      IF(LWORT(1).EQ.END)  GO TO 99                                     240
      IF(LWORT(1).NE.LAB)  GO TO 5                                      250
      READ(MIG)J,(FELD(K),K=1,J)                                        260
      IF(LWORT(1).NE.MAT)  GO TO 5                                      270
      NM=IFELD(4)                                                       280
      MOG=MCGRUP                                                        290
   14 READ(MIG) J,(FELD(K),K=1,J)                                       300
      IF(J.EQ.0)  GO TO 100                                             310
      NMM=NM                                                            320
      IF(IFELD(1).GT.MOG)  GO TO 7                                      330
      IF(IFELD(1).LT.MCG)  GO TO 5                                      340
      I=IFELD(1)                                                        350
      NST=IFELD(2)*IFELD(3)                                             360
      READ(MIG) J,(FELD(K),K=1,J)                                       370
      NZ=J/NST                                                          380
      DO 12 L=1,NST                                                     390
      S=0.                                                              400
      DO 8 J=1,NZ                                                       410
      K=L+2+(J-1)*NST                                                   420
    8 S=S+FELD(K)                                                       430
      IF(S*0.9995.LE.1.)  GO TO 9                                       440
   10 WRITE(NOUT,11) LAB,MAT,I,S                                        450
   11 FORMAT(1HO/' TEST9 : LABEL',A9,' MATERIAL',A9,' AUSSTREUGRUPPE',I5 460
     1,' DIE SUMME UEBER ALLE EINSTREUGRUPPEN BETRAEGT',E16.8)          470
      GO TO 101                                                         480
    9 IF(S*1.0005.GT.1.)  GO TO 12                                      490
      GO TO 10                                                          500
   12 CONTINUE                                                          510
      MOG=MOG-1                                                         520
      IF(MOG.LT.MUGRUP)  GO TO 100                                      530
      NMM=NM-1                                                          540
    7 DO 13 L=1,NMM                                                     550
   13 READ(MIG)                                                         560
      GO TO 14                                                          570
   99 WRITE(NOUT,98) LAB,MAT                                            580
   98 FORMAT(1HO/' TEST9 : DER LABEL',A9,' IST NICHT VORHANDEN, ODER DAS 590
     1 MATERIAL',A9/' IST IN DEN GEWUENSCHTEN GRUPPEN IN DIESEM LABEL NI 600
     2CHT ENTHALTEN')                                                   610
  101 KK=1                                                              620
  100 WRITE(NOUT,200)MAT,TYP,LAB,MOGRUP,MUGRUP                          630
  200 FORMAT('    ENDE VON TEST9 FUER MATERIAL',A9,' TYP',A9,' LABEL',A9 640
     1,' IN DEN GRUPPEN',I5,' BIS',I5)                                  650
      RETURN                                                            660
      END                                                               670
```

```
      SUBROUTINE FSPIE                                                  10
C     FSPIE IS A SPECIAL ERROR-DETECTING SUBROUTINE ,WHICH IN CASE      20
C     OF AN ABNORMAL END  DETERMINS THE PSW  AND PRINTS THIS PSW +      30
C     A TRACE-BACK + THE REGISTER CONTENTS + THE SYSTEM COMPLETION      40
C     CODE..    FOR  FSPIE IS INSTALATION DEPENDENT ITS CODE IS NOT     50
C     DISTRIBUTED HERE                                                  60
      RETURN                                                            70
      END                                                               80
C                                                                       10
C     ROUTINE FOR PRODUCING AN UNFORMATTED INPUT-FILE                   20
C                                                                       30
C                                                                       40
      SUBROUTINE FREEFO (INP,NFI,NFO,LF,F,NF)                           50
      DIMENSION LF(1),F(1),NF(1),JZ(2)                                  60
      REAL*8 N8,NV8/5HNUFIN/,VC                                         70
      LOGICAL*1 JF(8),JX(2)                                             80
      INTEGER*2 NFE(80),LV(18),JY(4),LL,JKFE,STERN/2H* /                90
      EQUIVALENCE (JZ(1),JF(1),JY(1),N8),(LL,JX(1))                    100
      DATA LV(1)/1H /,LV(2)/1HO/,LV(3)/1H1/,LV(4)/1H2/,LV(5)/1H3/,     110
     1LV(6)/1H4/,LV(7)/1H5/,LV(8)/1H6/,LV(9)/1H7/,LV(10)/1H8/,         120
     2LV(11)/1H9/,LV(12)/1H+/,LV(13)/1H+/,LV(14)/1H-/,LV(15)/1H./,     130
     3LV(16)/1HE/,LV(17)/1H@/,LV(18)/1H'/,LE/4HHEXA/,LFO/4HFORM/       140
     4,LSPE/4HSPEC/,LNO/4HNORM/                                        150
C                                                                      160
C                                                                      170
C                                                                      180
      IY=80                                                            190
      GOTO 9111                                                        200
C                                                                      210
C                                                                      220
      ENTRY FREE72 (INP,NFI,NFO,LF,F,NF)                               230
      IY=72                                                            240
C                                                                      250
C                                                                      260
 9111 V=1.                                                             270
      MV=1                                                             280
      LPP=0                                                            290
      NF(1)=0                                                          300
      LSU=0                                                            310
      LS=0                                                             320
      LP=0                                                             330
      NS=0                                                             340
      LO=0                                                             350
      N=0                                                              360
      LL=LV(1)/256                                                     370
      KSPNO=0                                                          380
      KOUT=0                                                           390
C                                                                      400
C                                                                      410
C                                                                      420
   33 IF(NF(1).EQ.LE) GOTO 2                                           430
```

```
      IF(NF(1).EQ.LFO) GOTO 2
      GOTO 201
  200 KOUT=1
      GOTO 12
  201 JZ(1)=NF(1)
      JZ(2)=NF(2)
      IF(N8.EQ.NV8) GOTO 200
      READ (INP,1,END=200,ERR=3) (NFE(I),I=1,80)
    1 FORMAT(80A1)
      GO TO 4
    2 IF(NFI)203,203,202
  202 ENDFILE NFI
      REWIND NFI
  203 RETURN
    3 WRITE (NFO,5)
    5 FORMAT(1HO/48H ERROP-CONDITION IN DATA TRANSFER OR INPUT-ERROR)
      STOP
    4 IF (IY.EQ.80) GOTO 6667
      JKFE=NFE(73)
      NFE(73)=STERN
 6667 WRITE (NFO,6) (NFE(I),I=1,80)
    6 FORMAT(1X,80A1)
      IF (IY.EQ.80) GOTO 6668
      NFE(73)=JKFE
C
C
C
 6668 IF(NF(1).EQ.LNO) GOTO 500
      IF(NF(1).EQ.LSPE) GOTO 501
      GOTO 502
  500 KSPNO=0
      GOTO 11
  501 KSPNO=1
      GOTO 11
  502 IF(NFE(1).EQ.LV(1)) GOTO 10
      IF(N)11,11,12
   12 IF(NFI)13,13,144
  144 IF(KSPNO)145,145,14
   14 WRITE (NFI) N,(NF(I),I=1,N)
  111 IF(KOUT)11,11,2
  145 WRITE (NFI) (NF(I),I=1,N)
      GOTO 111
   13 NS=NS+1
      LF(NS)=N
      N1=NS+1
      N2=NS+N
      N=0
      DO 15  I=N1,N2
      N=N+1
   15 LF(I)=NF(N)
      NS=N2
      GOTO 111
   11 N=0
      J=0
      GO TO 16
   10 J=1
   16 J=J+1
C
C
C
   97 DO 20  K=1,18
      IF(NFE(J).EQ.LV(K)) GO TO 21
   20 CONTINUE
      GO TO 3
C
C
C
   21 IF(K-1)30,30,22
   30 IF(LS)31,31,32
   31 IF(J-IY)16,33,33
C
C
C
   32 IF(LPP)40,40,41
   40 N=N+1
      NF(N)=LSU*MV
   47 LSU=0
      LS=0
      LC=0
      MV=1
      V=1.
      GOTO 31
C
C
C
   41 M=LP-LS
      IF(LS-9)42,43,43
   43 LSU=LSUR
   42 IF(M)44,45,46
   44 IF(78+M)3,3,45
   46 IF(75-M)3,3,45
   45 N=N+1
      VC=V
      F(N)=DFLOAT(LSU)*VC*10.**M
      LP=0
      LPP=0
      GO TO 47
C
C
C
   22 IF(K-11)50,50,23
   50 LS=LS+1
      LSU=10*LSU+K-2
      IF(LS-9)511,52,511
   52 LSUR=LSU
  511 IF(LPP)51,51,883
  883 LC=-1
      J=J+1
      IF(J-IY)884,884,32
   51 IF(J-IY)16,32,32
C
C
```

```
C
   23 IF(K-14)60,60,24
   60 IF(LO)61,61,3
   61 LO=1
      IF(K-14)62,63,63
   63 V=-1.
      MV=-1
   62 IF(J-IY)64,3,3
   64 J=J+1
      DO 65  K=2,11
      IF(NFE(J).EQ.LV(K)) GO TO 50
   65 CONTINUE
      IF(NFE(J).EQ.LV(15)) GO TO 70
      GO TO 3
C
C
C
   24 IF(K-15)70,70,25
   70 IF(LP)71,71,3
   71 LP=LS
      LPP=1
      IF(J-IY)72,73,73
   73 IF(LS)3,3,41
   72 J=J+1
      DO 74  K=2,11
      IF(NFE(J).EQ.LV(K)) GO TO 50
   74 CONTINUE
      IF(NFE(J).EQ.LV(1)) GO TO 73
      IF(NFE(J).EQ.LV(16)) GO TO 81
      LC=0
  884 LA=0
      LV1=1
      LP1=0
      IF(J-IY)882,882,3
C
C
C
   25 IF(K-16)80,80,26
   80 IF(LPP)3,3,81
   81 LA=0
      LC=1
      LV1=1
      LP1=0
      IF(J-IY)82,3,3
   82 J=J+1
      IF(NFE(J).EQ.LV(1)) GO TO 83
  882 IF(NFE(J).EQ.LV(12)) GO TO 83
      IF(NFE(J).EQ.LV(13)) GO TO 83
      IF(NFE(J).EQ.LV(14)) GO TO 84
      IF(LC)97,3,85
   84 LV1=-1
   83 IF(J-IY)86,3,3
   86 J=J+1
   85 DO 87 K=2,11
      IF(NFE(J).EQ.LV(K)) GO TO 88
   87 CONTINUE
      IF(NFE(J).EQ.LV(1)) GO TO 89
      GO TO 3
   89 IF(LA)3,3,90
   88 LA=1
      LP1=10*LP1+K-2
      IF(J-IY)86,90,90
   90 LP=LP+LP1*LV1
      GO TO 41
C
C
C
   26 IF(K-17)300,300,301
  300 M=5
      K7=17
      GO TO 117
  301 M=4
      K7=18
  117 LC=0
  116 LA=0
      DO 100  L=1,4
  100 JY(L)=LV(1)
  110 J=J+1
      IF(J-IY)101,102,102
  102 IF(NFE(J).EQ.LV(K7)) GOTO 120
      LC=0
      GOTO 121
  120 J=J-1
  121 IF(LC)33,3,112
  101 IF(NFE(J).EQ.LV(K7)) GO TO 106
      GO TO 107
  106 IF(LC)105,3,102
  107 LA=LA+1
      LC=1
      LL=NFE(J)
      JF(LA)=JX(1)
      IF(LA-M)110,112,112
  112 N=N+1
      NF (N)=JZ(1)
      IF(K-17)433,433,434
  433 N=N+1
      NF (N)=JZ(2)
  434 LC=-1
      IF(NFE(J+1).EQ.LV(K7)) GOTO 110
      GOTO 116
  105 IF(NFE(J+1).EQ.LV(1)) GOTO 16
      GO TO 3
      END
```

```
C-GRUSEEK           08.11.72                                                10
C-GRBRD             GRUBARD                                                 20
C                                                                           30
C     LESEROUTINE GRUBA                                                     40
C                                                                           50
      SUBROUTINE GRB (FELD,LMAX,NTGRB,ID,NUBGR,NDTM,NGR,*,*)                60
C                                                                           70
      REAL*4 GR(2)                                                          80
      REAL*8 TYP(2),MAT(2),ID,ID1                                           90
      INTEGER*4 FELD(2),ST(2)                                              100
C                                                                          110
      IENT=1                                                               120
      GO TO 1                                                              130
C                                                                          140
      ENTRY GRBA (FELD,LMAX,NTGRB,ID,NUBGR,NDTM,NGR,NST,NTYP,NMAT,*,*)     150
C                                                                          160
      IENT=2                                                               170
    1 NRC=422                                                              180
      NRC1=NRC-1                                                           190
C                                                                          200
      CALL DEFI (NTGRB,3000,4HU    ,NRC,IAS)                               210
C                                                                          220
      READ (NTGRB'1) ID1,NDTM,NGR,NST,NTYP,NMAT,K  ,K,JGR,K,JTYP,K,K,      230
     * (FELD(I),I=1,NGR)                                                   240
C                                                                          250
      IF(ID.NE.ID1) RETURN 2                                               260
      LH=NGR+3*NRC                                                         270
      IF(LH.GT.LMAX) RETURN 1                                              280
      IF(IENT.EQ.1) GO TO 10                                               290
C                                                                          300
      LMAX=LH                                                              310
      RETURN                                                               320
C                                                                          330
      ENTRY GRBE (GR,ST,TYP,MAT)                                           340
C                                                                          350
      IAS=JGR/NRC+1                                                        360
      READ (NTGRB'IAS) (GR(I),I=1,NGR),(ST(I),I=1,NGR)                     370
      IAS=JTYP/NRC+1                                                       380
      READ(NTGRB'IAS) (TYP(I),I=1,NTYP),(MAT(I),I=1,NMAT)                  390
C                                                                          400
      CALL DATGRB (NTGRB,NRC,IAS,NGR,NTYP,NMAT,NUBGR,FELD,TYP,MAT,         410
     * FELD(NGR+1))                                                        420
C                                                                          430
      RETURN                                                               440
C                                                                          450
   10 LTYP=(NGR+1)/2*2                                                     460
      NTYP2=2*NTYP                                                         470
      NMAT2=2*NMAT                                                         480
      LMAT=LTYP+NTYP2                                                      490
      IAS=JTYP/NRC+1                                                       500
      READ (NTGRB'IAS) (FELD(LTYP+I),I=1,NTYP2),(FELD(LMAT+I),I=1,NMAT2)   510
      LH=LMAT+NMAT2                                                        520
      K=LH+3*NRC                                                           530
      IF(K.GT.LMAX) RETURN 1                                               540
      LMAX=K                                                               550
C                                                                          560
      CALL DATGRB (NTGRB,NRC,IAS,NGR,NTYP,NMAT,NUBGR,FELD,FELD(LTYP+1),    570
     * FELD(LMAT+1),FELD(LH+1))                                            580
C                                                                          590
      RETURN                                                               600
      END                                                                  610



C-DATGRBRD          GRUBARD                                                 10
C                                                                           20
C     LESEN DATENSATZ GRUPPE,MATERIAL,TYP  VON GRUBA                        30
C                                                                           40
      SUBROUTINE DATGRB (NTGRB,NRC,IAS,NGR,NTYP,NMAT,NUBGR,JAGR,            50
     * TYPF,MATF,L)                                                         60
C                                                                           70
      INTEGER*4 JAGR(2),L(2),      DAT(2),NI/-2147483647/,IL(3)/3*0/        80
      REAL*8 TYPF(2),MATF(2),TYP,MAT                                       90
C                                                                          100
      NRC1=NRC-1                                                           110
      NRC2=2*NRC                                                           120
      NERK=NTYP*NMAT+1                                                     130
      CALL ITL (NTGRB,NRC,IAS,L,IL)                                        140
      RETURN                                                               150
C                                                                          160
      ENTRY DATNAM (IGR,MAT,TYP,NVARB,NDAT,DAT,*,*)                        170
C                                                                          180
      ITYP=NVGL(NTYP,TYPF,TYP)                                             190
      IMAT=NVGL(NMAT,MATF,MAT)                                             200
      IF(ITYP.EQ.0.OR.IMAT.EQ.0) RETURN 2                                  210
      GO TO 1                                                              220
C                                                                          230
      ENTRY DATNR (IGR,IMAT,ITYP,NVARB,NDAT,DAT,*,*)                       240
C                                                                          250
    1 IF(IGR.GT.NGR) RETURN 2                                              260
      IF(ITYP.GT.NTYP.OR.IMAT.GT.NMAT) RETURN 2                            270
      NDAT=0                                                               280
      NVARB=0                                                              290
      KERK=1                                                               300
      KDAT=2                                                               310
      KH=3                                                                 320
      JERK=0                                                               330
      JDAT=NRC                                                             340
      JH=NRC2                                                              350
      IGRH=IGR                                                             360
C                                                                          370
   43 IERK=JAGR(IGRH)+(ITYP-1)*NMAT+IMAT-1                                 380
      ISERK=(IERK+NRC1)/NRC                                                390
   42 CALL TL (KERK,ISERK)                                                 400
   44 IERK=IERK-(ISERK-1)*NRC                                              410
      K1=L(JERK+IERK)                                                      420
      IF(K1.EQ.NI) RETURN 1                                                430
      IF(K1.LT.0) GO TO 31                                                 440
C                                                                          450
      NDAT=1                                                               460
```

```
      DAT(1)=K1
      RETURN
C
   31 K1=-K1
      IF(K1.GT.NGR) GO TO 41
      IF(NUBGR.EQ.0) RETURN
      IGRH=K1
      K=1
   38 KERK=3
      KDAT=3
      KH=3
      JERK=NRC2
      JDAT=NRC2
      JH=NRC2
      GO TO (43,42),K
C
   41 NVARB=K1/134217728
      J=K1-NVARB*134217728
      IF(J.GT.(JAGR(IGRH)+NERK)) GO TO 51
      IERK=J
      ISERK=(IERK+NRC1)/NRC
      IF(ISERK.EQ.IL(KERK)) GO TO 44
C
      K=2
      GO TO 38
C
   51 JS=(J+NRC1)/NRC
      ISH=ISERK
      I1=IERK+1
      JH1=JERK
      IF(IERK.LT.NRC) GO TO 32
      ISH=ISH+1
      CALL TL (KERK,ISH)
   34 I1=1
C
   32 DO 33 I=I1,NRC
      K2=L(JH1+I)
      IF (K2.GE.0.OR.K2.EQ.NI) GO TO 33
      K2=-K2
      IF (K2.LE.NGR) GO TO 33
      NDAT=K2-K2/134217728*134217728-J
      IF (NDAT.LT.0) GO TO 33
      GO TO 35
   33 CONTINUE
C
      JH1=JH
      ISH=ISH+1
      CALL TL (KH,ISH)
      GO TO 34
C
   35 J=J-(JS-1)*NRC
      CALL TL (KDAT,JS)
C
      DO 37 IDAT=1,NDAT
      IF(J.LE.NRC) GO TO 39
      JS=JS+1
      CALL TL (KDAT,JS)
      J=1
   39 DAT(IDAT)=L(JDAT+J)
   37 J=J+1
C
      RETURN
      END
```

```
C-ITLRD              GRUBARD                                    10
C                                                               20
C     LESEN GESUCHTER SATZ ODER UMSPEICHERN                     30
C                                                               40
      SUBROUTINE ITL (NTGRB,NRC,IAS,L,IL)                       50
C                                                               60
      INTEGER*4        IL(2),L(2)                               70
C                                                               80
      RETURN                                                    90
C                                                               100
      ENTRY TL (K,KS)                                           110
C                                                               120
      IF(IL(K).EQ.KS) RETURN                                    130
      I1=(K-1)*NRC                                              140
      DO 1 I=1,3                                                150
      IF(KS.EQ.IL(I)) GO TO 2                                   160
    1 CONTINUE                                                  170
      IL(K)=KS                                                  180
      READ (NTGRB'KS) (L(I1+I),I=1,NRC)                         190
      RETURN                                                    200
C                                                               210
    2 CONTINUE                                                  220
      IL(K)=KS                                                  230
      I2=(I-1)*NRC                                              240
      DO 3 I=1,NRC                                              250
    3 L(I1+I)=L(I2+I)                                           260
      RETURN                                                    270
      END                                                       280
```

```
C-NVGLRD             GRUBARD                                    10
C                                                               20
C     SUCHEN INDEX NAME                                         30
C                                                               40
      INTEGER FUNCTION NVGL (N,NAME,NAM)                        50
C                                                               60
      REAL*8 NAME(2),NAM                                        70
C                                                               80
      NVGL=0                                                    90
      DO 1 I=1,N                                                100
      IF(NAM.EQ.NAME(I)) GO TO 2                                110
    1 CONTINUE                                                  120
      RETURN                                                    130
    2 NVGL=I                                                    140
      RETURN                                                    150
      END                                                       160
```

```
C     MIKOR - EIN PROGRAMM ZUR KORREKTUR VON RESONANZSELBSTABSCHIRM -
C     FAKTOREN, DIE MIT DEN MIGROS-2 MODULN 1,2 ODER 3 BERECHNET
C     WURDEN
C
      REAL*8 LABEL(3),LAB,LLAB,LB,MAT,MTYP(5),FSTRUK(5),GSTRUK(6),TYP(6)
     1,END
      DIMENSION SIGO(7),FELD(2000),IFELD(2000),WERT(7,6),L(6)
      EQUIVALENCE (FELD(1),IFELD(1)),(FELD(1),LB)
      DATA LABEL/'MIGR    ','FSTAT   ','STRK    '/,END/'ENDE    '/,
     1SI/'ALL '/,MTYP/'FG      ','FN      ','FF      ','FN1     ',
     2'FT1     '/,FSTRUK/'FA      ','FN      ','FN01    ','FN1     ',
     3'FT1     '/,GSTRUK/'FC      ','FN      ','FF      ','FN01    ',
     4'FN1     ','FT1     '/,LLAB/'        '/
      CALL FSPIE
      NINP=5
      NOUT=6
      NF=8
      MIG=3
      MKO=9
      IA=1
      CALL FREEFO (NINP,NF,NOUT,FELD,FELD,FELD)
      READ (NF) IGSATZ
   25 READ (NF) LAB
      IF(LAB.EQ.END)  GO TO 39
      IF(LAB.EQ.LABEL(3))  GO TO 1
      READ (NF) MAT,TEMP,NG,NT,(TYP(I),I=1,NT),NSIG,(SIGO(I),I=1,NSIG),
     1((WERT(K,I),K=1,NSIG),I=1,NT)
      GO TO 26
    1 READ (NF) MAT,ISTRUK,NG,NT,(TYP(I),I=1,NT),NSIG,(SIGO(I),I=1,NSIG)
     1,((WERT(K,I),K=1,NSIG),I=1,NT)
   26 IF(IA.EQ.2.AND.LAB.EQ.LLAB) GO TO 27
    2 READ (MIG) J,(FELD(I),I=1,J)
      WRITE (MKO) J,(FELD(I),I=1,J)
      IF(J.NE.0) GO TO 2
   13 BACKSPACE MIG
      BACKSPACE MKO
      READ (MIG) J,(FELD(I),I=1,2)
      WRITE (MKO) J,(FELD(I),I=1,2)
      IF(LB.EQ.END) GO TO 100
      IF(LB.NE.LAB) GO TO 2
   27 MOG=IGSATZ-NG
      READ (MIG) J,(FELD(I),I=1,J)
      WRITE (MKO) J,(FELD(I),I=1,J)
      IF(LB.NE.MAT) GO TO 2
   14 IF(LAB.EQ.LABEL(3)) GO TO 3
      T=FELD(3)
      NGG=IFELD(4)
      DO 5 K=1,NT
      DO 4 M=1,5
      IF(TYP(K).EQ.MTYP(M)) GO TO 5
    4 CONTINUE
   10 WRITE (NOUT,6) LAB,TYP
    6 FORMAT(/' IN LABEL',A9,' IST DER TYP',A9,' NICHT ENTHALTEN')
      GO TO 101
    5 L(K)=M
      GO TO 9
    3 NGG=IFELD(3)
      IF(ISTRUK.EQ.1) GO TO 7
      DO 18 K=1,NT
      DO 8 M=1,5
      IF(TYP(K).EQ.FSTRUK(M)) GO TO 18
    8 CONTINUE
      GO TO 10
   18 L(K)=M
      GO TO 9
    7 DO 19 K=1,NT
      DO 11 M=1,6
      IF(TYP(K).EQ.GSTRUK(M)) GO TO 19
   11 CONTINUE
      GO TO 10
   19 L(K)=M
    9 IF(LAB.EQ.LABEL(3)) GO TO 34
      IF(T.LT.TEMP) GO TO 12
      IF(T.GT.TEMP) GO TO 32
   34 IF(NGG.LT.MOG) GO TO 12
      IF(NGG.EQ.MOG) GO TO 15
      GO TO 2
   12 READ (MIG) J,(FELD(I),I=1,J)
      WRITE (MKO) J,(FELD(I),I=1,J)
      IF(J.EQ.0) GO TO 13
      IF(LB.NE.MAT) GO TO 12
      GO TO 14
   32 WRITE (NOUT,33) LAB,MAT,TEMP,NG
   33 FORMAT(/' DIE IN DER EINGABE SPEZIFIZIERTEN DATEN ZU LABEL',A9,' M
     1ATERIAL',A9,' TEMPERATUR',F9.2,' GRUPPE',I5/' SIND NICHT VON MIGRO
     2S BERECHNET WORDEN')
      GO TO 101
   15 READ (MIG) J,(FELD(I),I=1,J)
      WRITE (MKO) J,(FELD(I),I=1,J)
      IF(SIGO(1).EQ.SI) GO TO 20
      DO 17 M=1,NSIG
   22 READ (MIG) J,(FELD(I),I=1,J)
      MS=0
      IF(J.EQ.0) GO TO 28
      IF(LB.EQ.MAT) GO TO 16
      IF(FELD(1).EQ.SIGO(M)) GO TO 21
      WRITE (MKO) J,(FELD(I),I=1,J)
      GO TO 22
   21 DO 36 K=1,NT
      N=L(K)
   36 FELD(N+1)=WERT(M,K)
      WRITE (MKO) J,(FELD(I),I=1,J)
      WRITE (NOUT,23) MAT,NG,(FELD(I),I=1,J)
   23 FORMAT(/A10,I6/7E16.8)
   17 CONTINUE
   24 READ (MIG) J,(FELD(I),I=1,J)
      MS=1
      IF(J.EQ.0) GO TO 28
      IF(LB.EQ.MAT) GO TO 16
      WRITE (MKO) J,(FELD(I),I=1,J)
      GO TO 24
   16 IF(MS.EQ.1) GO TO 29
```

```
 31 WRITE (NOUT,30) LAB,MAT,NG                                          1130
 30 FORMAT(/' ES KONNTEN NICHT ALLE WERTE ERSETZT WERDEN FUER',2A10,    1140
   1' GRUPPE',I5)                                                       1150
    GO TO 101                                                           1160
 29 IA=2                                                                1170
    LLAB=LAB                                                            1180
 37 BACKSPACE MIG                                                       1190
    GO TO 25                                                            1200
 28 IF(MS.EQ.0) GO TO 31                                                1210
    IA=1                                                                1220
    GO TO 37                                                            1230
 20 READ (MIG) J,(FELD(I),I=1,J)                                        1240
    MS=1                                                                1250
    IF(J.EQ.0) GO TO 28                                                 1260
    IF(LB.EQ.MAT) GO TO 16                                              1270
    DO 38 K=1,NT                                                        1280
    M=L(K)                                                              1290
 38 FELD(M+1)=WERT(1,K)                                                 1300
    WRITE (MKO) J,(FELD(I),I=1,J)                                       1310
    WRITE (NOUT,23) MAT,NG,(FELD(I),I=1,J)                              1320
    GO TO 20                                                            1330
 39 READ(MIG) J,(FELD(I),I=1,J)                                         1340
    IF(J.NE.0)  GO TO 40                                                1350
    BACKSPACE MIG                                                       1360
    READ(MIG) J,(FELD(I),I=1,2)                                         1370
    WRITE(MKO)J,(FELD(I),I=1,2)                                         1380
    IF(LB.EQ.END)  GO TO 101                                            1390
    GO TO 39                                                            1400
 40 WRITE(MKO) J,(FELD(I),I=1,J)                                        1410
    GO TO 39                                                            1420
100 WRITE (NOUT,35) LAB,MAT,NG                                          1430
 35 FORMAT(/' DIE IN DER EINGABE SPEZIFIZIERTEN DATEN ZU LABEL',A9,' M  1440
   1ATERIAL',A9,' GRUPPE',I5/' SIND NICHT VON MIGROS BERECHNET WORDEN'  1450
   2)                                                                   1460
101 STOP                                                                1470
    END                                                                 1480
```

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