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ROSAT Data Analysis with EXSAS

H.U. Zimmermann, T. Belloni, C. Izzo, P. Kahabka, O. Schwentker
(MPI für Extraterrestrische Physik, Garching, FRG)

For the X-ray observatory ROSAT, data from survey and pointed mission phases taken with different focal plane instruments and according to a complex mission timeline have to be handled. Data analysis therefore puts high demands on appropriate software tools. With EXSAS – the EXtended Scientific Analysis System developed with an effort of 20 men years by the German ROSAT Scientific Data Center – a comfortable system for the reduction of data from the ROSAT X-ray and XUV instruments has been made available. EXSAS comprises a large collection of application modules as typically required in analyzing data of this wavelength regime and runs as a specific context in the wide-spread ESO-MIDAS environment. EXSAS, completely written in FORTRAN 77, takes full advantage of all the standards used in MIDAS and therefore reflects the same portability (different UNIX installations and VMS). If required, the FORTRAN code also enables users to adapt the software in an easy way to their specific needs. To maintain independence from the specifics of different operating systems also on the data input side, all ROSAT data are distributed in the widely accepted FITS format. Although EXSAS has been developed specifically for data analysis of the ROSAT instruments, its structural design is sufficiently general to serve equally well also data from other X-ray and XUV instruments.

EXSAS analysis modules are grouped into 4 application packages dealing with Data Preparation and Instrument Correction, Spatial Analysis, Spectral Analysis and Timing Analysis. A special EXSAS header, read and updated by each application, maintains the general information transfer on the origin, the history and the parameter space of the data stored in tables and images. About 100 genuine commands (most of which offer several additional options) allow to interactively explore the functionality of the system.

Up to now 40 institutes all over the world have requested the EXSAS software. Maintenance and regular updates of the software and the comprehensive documentation are provided by the ROSAT Scientific Data Center at Garching.