NASA TECH BRIEF

Computer Program for Optical Systems Ray Tracing

This program traces rays of light through optical systems consisting of up to 65 different optical surfaces and computes the aberrations. For design purposes, paraxial tracings with astigmation and third order tracings are provided. The procedure accounts for various tilts of the surfaces with respect to the optical axis which are introduced either by design or by manufacturing tolerances.

Five different types of optical surface are treated, and provision is made to test for each type. Also, the computations are carried out for three different values of the refractive index. Provision is made for introducing new surfaces, or variations of the original ones, into the system after the computations for the original have been made. The input of all variables is on cards.

The basic coordinate system used is a right-handed cartesian system with the positive Z-axis directed along the optical axis, the Y-axis directed positive vertically, with the X-axis completing the right-handed system.

An option to run several types of systems at once is available, which gives the advantage of computing large numbers of experiments in only one pass on the computer.

Notes:

1. This program is written in Fortran IV for use on the GE 635 computer.
2. Inquiries concerning this program may be made to:
   COSMIC
   Computer Center
   University of Georgia
   Athens, Georgia 30601
   Reference: B67-10549

Patent status:

No patent action is contemplated by NASA.

Source: Trindel J. Ferguson and Hermann Kohn
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