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XRTH/PC

A X-RAY Transport and Hydrodynamics Program for Personal Computer

The **XRTH/PC** an X-Ray Transport and Hydrodynamics code developed to evaluates X-ray deposition and its subsequent effects in one-dimensional layered media. This code is particularly adapted to the analysis of heating and stress wave propagation in the coating and substrates of optical systems such as mirrors, filters and radiators. It is written in FORTRAN 77, and is operating on a number of different computer systems. The original code was developed for Cray system in use by USASDC at Huntsville.

The first phase of **XRTH/PC** consists of an X-ray transport calculation. Up to 12 incidents or primary X-ray beams are defined by input spectrum, time dependence, direction, and intensity. Scattering and photoelectric processes attenuate these primary beams as they traverse the material. Much of the energy lost by the primary beam may be transferred to secondary electrons, but secondary photons are also produced. These secondary photons are analyzed by a discrete-ordinates method, in which several inclination angles in both forward and backward hemispheres are established in advance, and the scattered and fluorescent radiation from each primary beam is divided into secondary beams in each of these discrete directions.

Scattering and photoelectric processes are treated for the secondary photons in the same manner as for the primary beams, although the energy group structure for secondary photons is not necessarily the same as for the primary photons. The successive generations of photons produced by scattering and fluorescence are processed in turn, so that the system is solved iteratively rather than by matrix algebra.

Because the optical coatings typically have thicknesses 10.6 to 10 cm, the electron range cannot be neglected as-in X-ray deposition calculations often employed for bulk materials. The generation and transport of secondary electrons must therefore be treated in some detail, and this is done in the second phase of the **XRTH/PC** code.

We at **Galaxy Advanced Engineering (GAE) Inc.** have taken the steps to produce the PC version of **XRTH/PC**. Currently the program is operating on IBM 386 or 100% compatibles with 387 math-coprocessor under PC/DOS or MS/Windows 95/98/2000/XP/ME or NT operating system. The PC version has the same capability as Cray version. For more detail information how to obtain the PC version of the code please contact GAE at 650-302-3993.