Insight into Multi-Dimensional Transfer

Lawrence Auer

X-3, Applied Physics Division, Los Alamos National Laboratory

Although computers are becoming ever more powerful, modelers must be aware of potential computational dangers. Resolution of optical boundaries and interfaces is necessary in order to predict correctly the radiation field. For regular objects this is accomplished simply by using "logarithmic gridding" on the outside edges. For irregular objects, like prominences or loops, resolution of all the interior interfaces is a nearly insurmountable problem. Monte Carlo is a powerful and robust tool for validating deterministic results. It is particularly appropriate in this era of multi-processor computing. It automatically resolves all boundaries, avoids the "ray effects" inherent in the use of distinct rays, can easily treat even fractal structures, and should become a first-look tool for the investigation of the effect of geometrical structure on the radiation field.