

INTERCOMPARISON OF SHORTWAVE RADIATIVE TRANSFER
CODES AND MEASUREMENTS

Rangasayi N. Halthore
Brookhaven National Laboratory
Department of Applied Science
Environmental Chemistry Division
Upton, NY 11973-5000

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ABSTRACT

At the Gordon Conference on Solar Radiation and Climate held in June, 1998 in Plymouth, New Hampshire, some of the participants met and agreed to perform model intercomparisons for specific radiation components of the earth-atmospheric system in cloud-free skies to compare models against each other and where available, to evaluate against measurements. Model-to-model intercomparisons have value since not all models are equal - some, such as the line-by-line models, treat transmittance more accurately, whereas some broad-band models treat multiple scattering more accurately. Model-to-measurement comparisons give us a reality check if we know the accuracy of the measurements. The atmospheric radiation components identified to calculate and report are, in order of increasing complexity: direct downward solar irradiance at the surface; diffuse-downward shortwave irradiance at the surface; diffuse-upward shortwave flux at the surface; TOA upward flux. Four cases were identified as providing the necessary protocol for intercomparison: (i) standard atmosphere without aerosols; (ii) standard atmosphere with prescribed aerosol optical properties; (iii) actual atmosphere with measured aerosol properties and components of irradiance; (iv) standard atmosphere with a prescribed cloud and cloud properties but without aerosols. Each case involves two atmospheres and two geometries. More than 20 groups around the world are involved in this potentially funded effort that encompasses most of the original and frequently used models. Please check out web page:

<http://www.ecd.bnl.gov/~halthore/intercomp/intercomparison.html> for more information