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High Resolution Electro-Optical Aerosol Phase Function Database PFNDAT2006

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Abstract: The High Resolution Phase Function Database (PFNDAT) 2006 consists of a series of wavelength dependent phase functions, single scattering albedos, extinction coefficients, and asymmetry parameters for ten naturally occurring and four manmade aerosols along with brief descriptions of the scattering parameters, concentrations, and aerosol size distribution characteristics. The naturally occurring aerosols consist of maritime, urban, rural, tropospheric, fog, rain, snow, and dust aerosols; a wind-lofted desert aerosol; and the Navy Aerosol Model (NAM). The manmade aerosols consist of dust produced from high-explosive munitions, **white phosphorus**, fog oil, and hexachloroethane smokes. Many of the models are functions of relative humidity (RH), wind speed, and other parameters. The database includes information at wavelengths from 0.20 to 40.0 m, dependent on the availability of index of refraction data for each scattering species. PFNDAT2006 includes all PFNDAT2005 aerosols at increased angular and wavelength resolution: 153 angles versus the previous 65 angles. Additional information is provided for the NAM, and radiative transfer calculations are presented comparing the new Henyey-Greenstein snow phase function with the traditional Mie generated phase function. We corrected the following errors: the refractive index of **white phosphorus** at 1.06 m and 0%RH; all tropospheric aerosol values were calculated at 99% RH; and the snow phase functions were missing at 10.0 m and had two values for 11.0 m. Improvements include updated refractive indices for dust and wind-lofted desert aerosols. These and other minor changes have resulted in improved values. All updated values are included in the 65-angle version of PFNDAT2005 on the CD.

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