



APC: A New Code For Atmospheric Polarization Computations

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A new code APC (Atmospheric Polarization Computations) is presented. The diffuse field is decomposed into anisotropic and smooth regular parts. The anisotropic component (AC) is singled out using a small angle method [1], modified for the vector case, and is computed analytically. The problem for the regular part with the AC source function is solved numerically using the Discrete Ordinates Method [2]. A matrix-operator method [3] is used to model vertically inhomogeneous atmospheres. A bidirectional surface reflection models for the land and wind ruffled ocean surface are adapted from the code SHARM [4]. An automatic criterion is introduced to control the azimuthal (Fourier) convergence of the vector solution. The kernel model of spherical or spheroidal scattering [5] is incorporated as part of APC via a convenient interface. A scaling transformation [6] is used to avoid the instability of solution in optically thick atmospheres. The APC code is written in Fortran 90/95 using LAPACK libraries and validated against RT3 [7] and SCIATRAN [8] codes. Examples of APC simulations for polarimetric remote sensing will be presented.

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