



## The NOAA/ETL Discrete Ordinate Tangent Linear Radiative Transfer Model

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The NOAA/ETL Discrete Ordinate Tangent Linear Radiative Transfer (DOTLRT) v1.0 model has been designed as a fast code for calculating both brightness temperatures and their derivatives to the prognostic variables of cloud-resolving numerical weather prediction models. The DOTLRT code is based on a fast forward radiative algorithm that computes the Jacobian in the presence of scattering hydrometeors with the same computational complexity as a standard scattering-based DO forward transfer calculation. Baseline performance of the code suggest that it will be fast enough to facilitate all weather assimilation of microwave radiance data from the current and planned generation of passive microwave satellites. The DOTLRT code has been interfaced to the JCSDA Community Radiative Transfer Model (CRTM) for continued testing and performance intercomparison within the NCEP NWP model framework. The interface effort reported here is validated using five-phase NWP model cloud data for a hurricane at landfall. While DOTLRT v1.0 uses the Henyey Greenstein phase function approximation, the next generation (DOTLRT v2.0, now under development) uses the full Mie scattering phase function, and will be compatible with both DOTLRT v1.0 and the CTRM interface.