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Adaptive wavelet method for aerosol dynamic equation

A new and robust wavelet-based splitting method has been developed to solve the general aerosol equations. The considered models are the nonlinear integro-partial differential equations on time, size and space, which describe different processes of atmospheric aerosols including condensation, nucleation, coagulation, deposition, and sources as well as turbulent mixing.

The proposed method reduces the complex general aerosol dynamic equation to two directional splitting equations. Because there are steeply varying number densities across a size range, an adaptive wavelet strategy is developed to solve the size splitting equation effectively. And further the wavelet method and the finite difference method are alternately used for two directional splitting equations at each time interval.