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# A three-dimensional dynamic model of DSD microphysics in warm rain

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A 3D dynamic model for the resolution of the stochastic equation describing the evolution of the raindrop spectra in the presence of coalescence and collisional breakup is presented in this work. The numerical model uses a fixed pivot discretization scheme for the resolution of the stochastic equation, which provides flexibility in the grid selection and computational efficiency. The rain shaft model has been found to be able to capture the temporal evolution of the DSD in warm rain. In addition, simulation results are compared with experimental measurements in an attempt to better understand and quantify the dynamics of coalescence and breakup mechanisms in the evolution of raindrop spectra. In that sense, a scaling analysis is performed for the collision experiments in order to determine the space/time domain in which stable statistics are achieved. Scaling analysis results are used to characterize the coalescence/breakup mechanism and update the fragment distribution function to be implemented in the numerical model.