Author	Model considers	How it is archived	Assumptions	Results	Results in terms of cloud albedo
Chameides et al. 1984	Microphysics/ chemistry	Chemistry of a cloud with a time-dependent box model. The model treats the chemistry of the gas and the aqueous phase, as well as the exchange of species between the two phases.	The cloud is assumed to be saturated with water vapor at a temperature T and to contain a monodisperse chemically homogeneous distribution of N droplets with fixed re.	Cloud water is a very active chemical medium where significant levels of free radicals can exist, where many soluble species can be rapidly oxidized and where other species can be rapidly generated	NONE
Bower and Choularto, 1993	Microphysics/ chemistry	The cap-cloud chemistry model consists of three main sections that describe the airflow, the microphysics and the chemistry of the system.	Initial R =99% Adiabatic cooling of the air parcel in which the droplets reside.	Aerosol bimodal size distribution results downwind of the processing cap cloud The degree of modification on CCN spectrum emerging from the cloud is strongly correlated to the concentration of SO2.	The albedo of clouds will not be very strongly dependent on SO2, suggesting that reductions in future anthropogenic SO2 over the continent may have little effect on global warming through the cloud radiation feedback.
Ackerman et al. 1995	Microphysics/ chemistry	Model with three coupled components: microphysics module, turbulence module, and a multiple wavelength radiative transfer module	Constant velocities in the vertical	No decrease of drizzle fluxes with increasing CDNC and there decrease of LWC. Droplet radiative cooling leads to less droplet nucleation near cloud top. IR scattering has noticeable effects on the structure of the	NONE

Author	Model considers	How it is archivde	Assumptions	Results	Results in terms of cloud albedo
Feingold et at. 1998	Dynamics/ microphysics/ chemistry	LES: A large-eddy simulation Model describes boundary layer dynamics TEM: a trajectory ensemble model that includes coupled microphysical chemical model.	CCN homogenous composition	Strong sensitivity of gas and aerosol processing to parcel in-cloud residence time, and to cloud liquid water. Probability density functions of time available for heterogeneous chemistry	Drizzle may either be enhanced or suppressed depending on the concentration of CCN particles, the initial particle size spectrum, and the extent of processing.
Russell et al. 1999	Microphysics/ chemistry	Model with detailed aerosol description with simplified dynamics. Fluxes of gaseous precursors from MAST measurements	Constant vertical velocities and lapse rates External mixture	In the continentally influenced environment smaller change of re, CDNC and LWC in the ship track were found relative to the clean background conditions. Ultimately sulfur content in fuels enhances aerosol activation.	Larger residence time of particles in the cloud allow enough growing for precipitation that determined if microphysical processes are important for feedback effect on rain
Hegg & Larson, 1990	Microphysics/ chemistry	Langrarian adiabatic parcel model, using bulk and explicit parameterization of cloud chemistry. Dynamics are maintains as simply as possible	Constant velocities in the vertical. Droplet pH does not vary with size (bulk). Internal mixture	Bulk approach yield potential errors in the formation of SO_4 under conditions of low SO_2. Size distribution is dependent of droplet pH and thus SO_4 and NH_3	Important chemistry dependency of size distribution

Author	Model considers	How it is archived	Results	Results in terms of cloud albedo
Feingold, 2002	Dynamics/Microphysics/ chemistry	Cloud processing of aerosol through both drop collision coalescence and aqueous chemistry is simulated with the aid of a large eddy simulation model and fully coupled components that represent (1) size-resolved aerosol, (2) size-resolved microphysics, and (3) the conversion of SO2 to sulfate via aqueous chemistry.	The current model represents spatial and temporal variability of these parameters at large eddy scales on the order of a few hundred meters and timescales on the order of a few seconds.	The simulations indicate that aqueous chemistry can modify the dynamics and microphysics of stratocumulus clouds and illustrate the complexity of the coupled system. This work suggests that parameterizations of the effects of cloud processing of aerosol require careful consideration of the myriad feedbacks in the cloudy boundary layer.
Wanmin et al. 2006	Dynamics/Microphysics/ chemistry	AURAMS Aqueous-phase chemistry and scavenging processes are coupled with microphysical fields from the meteorological driver model and the size- and chemical-composition-resolved aerosols.	Aqueous-phase oxidation contributes about 30% to 40% of the total atmospheric SO4 production in the Eastern North America. Cloud chemistry is also.	shown to modify the aerosol size distribution, which in turn can either enhance or reduce aerosol scattering efficiency in different geographic regions depending on where on the aerosol size spectrum the mass is added