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Homogeneous freezing of ice particles, including effects of aerosol size distribution in the University of L'Aquila CCM.

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A low resolution climate-chemistry coupling model, including a microphysics code for aerosols growth and formation, is used to study ice particles formation in cirrus-clouds, including the effects of aerosol size distribution. The parameterization used is that for homogeneous freezing of supercooled aerosols of Kärcher and Lohmann (JGR, 2001), extended to include the effects of aerosol size on the freezing process in adiabatically rising air particles (Kärcher and Lohmann, JGR 2002). Aerosols size effects become important when the timescale of the freezing event is fast compared to the timescale of the depositional growth of the pristine ice particles. We present the results of the Ulaq-CCM about the feedback of aerosol size distribution on the mechanism of formation and growth of ice particles in the UT/LS region. Simulations are made considering aircraft and volcanic emissions which perturb the global amount of ultrafine particles.