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Parameterization of cirrus cloud formation in the University of L'Aquila climate-chemistry model

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A low resolution climate-chemistry coupled model including the most important aerosol components is used to study ice particle formation in upper tropospheric cirrus clouds (T$<$235 K). The parameterization used in this study is that described in the paper of Karcher and Lohmann (JGR, 2001) for homogeneous freezing of supercooled aerosols. Homogeneous freezing is considered here as the most important ice formation mechanism under upper tropospheric conditions. The adiabatic cooling due to the vertical ascent rate is the key parameter determining the population of ice particles (number density and radius). For this reason, a scaling of the large-scale vertical velocity field predicted in the model is needed, in order to have a realistic representation of small-scale freezing. We will present the first results from the ULAQ-CCM and the sensitivity to future climate changes due to trends of GHGs and aerosols.