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Evaluation and intercomparison of the aerosol number concentrations and CCNs in global models

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In this work preliminary results of the current status of BACCHUS global modeling of aerosol number concentrations and cloud condensation nuclei (CCN) are presented and compared to observations. So far, simulation results from the TM4-ECPL, ECHAM-HAM, ECHAM6-HAM2 and NorESM models have become available. Hourly model results for the aerosol number concentrations and CCN concentrations at various supersaturation ratios, as well as their corresponding daily and monthly averaged values are compared to the measurements from nine ACTRIS sites for the years 2010-2015. CCN concentration persistence obtained from the auto-correlation function of observational and model data is compared. Seasonal variations are also considered in the present analysis. In order to identify any common biases against observations, the model results are further analyzed in terms of the particles chemical composition and the set of hygroscopicity parameters used for the calculation of CCNs. Annual mean surface-level number concentrations of various particle sizes and CCNs at 0.2% supersaturation predicted by the models along with their corresponding chemical composition are presented and discussed.