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Changes of cloud statistics due to greenhouse warming in global nonhydrostatic simulations with explicit cloud processes

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We examined possible changes of statistical cloud behavior in a future climate by means of nonhydrostatic simulations with a horizontal resolution of globally 14 km. In the present research, we employ a scheme of explicit cloud physics to omit ambiguities arise from a cumulus parameterization. A control (present climate) simulation is started at 1 June 2004, and is temporally integrated for 5 months. For a future-climate run, we gave a doubled-CO2 concentration (696 ppm) along with a spatial distribution of the increased SST evaluated from AR4 model ensembles for a bottom boundary condition. Basic changes can be summarized as that the high-cloud amount increase about 2.7 %, and low-cloud amount decreases about 5.6 % in the simulated period. The estimated change of net cloud radiative forcing is as a result -6.9 W/m2. In a presentation, we will show a detailed analysis regarding a relation of cloud changes to variations of the general-circulative feature, cloud-radiative forcing, regional SSTs, and related environmental parameters.