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# Impacts of a prognostic large scale cloud scheme on a global forecasting system

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The prognostic large scale cloud scheme was implemented based on Tiedtke (1993) and its impact on a global forecasting system was investigated. It includes the source and sinking terms by advection, boundary mixing, convection, condensation, and evaporation. Compared with cloud fractions calculated from diagnostic cloud scheme, via prognostic cloud scheme, high cloud remarkably increased over equatorial region. The evaluation for short-range forecasts was conducted. The cold bias at the upper atmosphere was reduced because of increasing of high cloud. The improvement of the global forecasting system by prognostic cloud scheme was shown after 3 days-simulation because the cloud fraction in the prognostic cloud scheme is initially zero and the balance between source and sinking terms is made at 2-3 days of simulation. The evaluation for medium-range forecasts was also conducted. The results of the medium-range forecasts via prognostic cloud scheme show a better correlation with fnl reanalysis data, compared with that via diagnostic cloud scheme. The simulated precipitation was also compared with observation at 617 automatic weather stations operated by Korea Meteorological Administration. Equitable Threat Score (ETS) and bias score according to precipitation rate are calculated. Based on these statistical values, the accuracy of precipitation simulated from new physics package including prognostic cloud scheme was higher than that from old physics package including diagnostic cloud scheme. Currently, our physics package has been improved and the prognostic cloud scheme should be evaluated with the newly-improved physics packages.