Evaluation of two schemes representing cloud inhomogeneous structure in the Australian Community Climate and Earth System Simulator

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Two schemes representing cloud structure in a general circulation model has been implemented in the Australian Community Climate and Earth System Simulator (ACCESS) which is a fully coupled model developed in the Centre for Australian Weather and Climate Research (CAWCR). One scheme combines the 'tripleclouds' parameterization, introducing horizontal inhomogeneity in the model grid box in each layer, with 'exponential-random' overlap, in which clouds in adjacent layers are not overlapped maximally, but according to a vertical decorrelation scale. The other is Monte Carlo Independent Column Approximation approach. This first scheme has been fully tested in the ACCESS model. The results show that the scheme has a positive impact on the radiation calculations, leading to improving the cloud radiative forcing and model sea surface temperature simulations. The tests for the second scheme are still on the way. The evaluation for the schemes will be performed once the tests for the second scheme have been completed.