

Realities of developing and improving parameterizations related to clouds in global climate models

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The aim of the presentation is to introduce realities of developing and improving schemes related to clouds in global climate models. The representations of clouds in climate model MRI-ESM2 used in CMIP6 simulations are significantly improved from the previous version MRI-CGCM3 used in CMIP5 simulations. The score of the spatial pattern of radiative fluxes at the top of the atmosphere for MRI-ESM2 is better than any of the 48 CMIP5 models. We will show comprehensively various modifications related to clouds, which contribute to the improved cloud representation, and their main impacts. The modifications cover various schemes and processes including the cloud scheme, turbulence scheme, cloud microphysics processes, the interaction between cloud and convection schemes, resolution issues, cloud radiation processes, the aerosol properties, and numerics. We would like to emphasize that the improvement of performance in climate models is ordinarily contributed by many minor modifications.