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Uncertainities in low-cloud feedbacks

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Cloud feedbacks remain the main cause for inter-model differences in model-based estimates of climate sensitivity. The complexity of cloud feedbacks mandates use of simplified configuration such as atmosphere-only, aquaplanets, and single column models. Using simulations from various model intercomparison studies, such as Coupled Model Intercomparison Project (round 5), we quantify in detail the extent to which these simplified configurations can be used to study cloud feedbacks. In particular, we demonstrate the utility of single column models using an idealistic framework and explore key physical mechanisms of low cloud feedbacks. This study helps us to better understand the inter-model differences in low cloud feedbacks and further exploit the relative simplicity of configurations in synergy.