



## How consistent are precipitation patterns predicted by GCMs in the absence of cloud radiative effects?

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Model simulations with state-of-the-art general circulation models reveal a strong disagreement concerning the simulated regional precipitation patterns and their changes with warming. The deviating precipitation response even persists when reducing the model experiment complexity to aquaplanet simulation with forced sea surface temperatures (Stevens and Bony, 2013).

To assess feedbacks between clouds and radiation on precipitation responses we analyze data from 5 models performing the aquaplanet simulations of the *Clouds On Off Klima Intercomparison Experiment (COOKIE)*, where the interaction of clouds and radiation is inhibited. Although cloud radiative effects are then disabled, the precipitation patterns among models are as diverse as with cloud radiative effects switched on. Disentangling differing model responses in such simplified experiments thus appears to be key to better understanding the simulated regional precipitation in more standard configurations. By analyzing the local moisture and moist static energy budgets in the COOKIE experiments we investigate likely causes for the disagreement among models.

### References

Stevens, B. & S. Bony: What Are Climate Models Missing?, *Science*, 2013, 340, 1053-1054