Climatology Explains Intermodel Spread in Tropical Upper Tropospheric Cloud and Relative Humidity Response to Greenhouse Warming

Objective
• Identify and demonstrate model climatological controls on future changes in clouds and relative humidity

Research
• Theoretical research indicates that future changes in clouds and relative humidity may be related to their spatial distribution in the current climate
• This study investigates whether such theoretical research holds in CMIP5 atmosphere-ocean general circulation models (GCMs)
• This study shows that inter-model differences in GCM end-of-century projections of cloud and relative humidity changes can be predicted using the GCM’s climatological fields

Impact
• This research shows that improving model representation of the current, observable climate should lead to more reliable projections
• Future changes in clouds and relative humidity may be constrained using current observations