



Global Water Vapor variations in the Upper Troposphere and Lower Stratosphere in high-top CMIP5 simulations

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Recent research has demonstrated that observed variations of the global water vapor into the lower stratosphere are an important driver of decadal global surface climate change. Therefore, variations of the water vapor into the lower stratosphere can provide a source of decadal variability for the climate system. However, there is still a need to improve the representation of the UTLS water vapor distribution and its variations in climate models.

The intra-seasonal, interannual and inter-decadal variability of the water vapor in the UTLS is examined in long-term simulations with coupled troposphere-stratosphere-ocean models and compared with global observational datasets. The models have a well-resolved stratosphere with a high vertical resolution and are fully coupled to a dynamical ocean model. The simulations are performed within the Coupled Model Intercomparison Project – phase 5 (CMIP5).

The evaluation will cover several aspects with respect to the UTLS water vapor distribution. What is the role of improved vertical resolution? How well do models represent the cold point and dehydration? How are tropical clouds and their impact on the TTL represented?