



Impact of stochastic- and super-parameterisation of convection on precipitation in the ECMWF model

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Convection and cloud processes play a key role in the dynamics of the atmosphere, especially in the Tropics. Yet, even today our shortcomings in parameterising convection in global climate models (GCMs) are limiting our ability to simulate and understand the climate and weather of the planet. Recent innovative ideas on convection parameterisation such as super-parameterisation (embedding cloud resolving models within the GCM grid) or stochastic parameterisation implemented in the ECMWF climate model has helped improve its representation of the climate and weather systems. These two approaches in convection parameterisation have emerged as new paths forward and complement the conventional approaches rather than replace them. We study the impact of these two approaches and a combination of the two on the precipitation in the Tropics and organized convective systems such as the MJO. Results from the analysis of the impact on the distribution of precipitation and the amplitude and character of MJO events due to super-parameterisation and stochastic parameterisation will be presented. This has implications on improving conventional convection parameterisation using hybrid approaches as we await the exascale computing systems of the future to resolve convection in climate models.