



Equatorial waves in some CMIP5 coupled models

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The Kelvin and the Rossby-gravity waves (RGWs) packets with periods of few days are extracted in some simulations done for CMIP5. The analysis shows that the models differ very substantially in simulating these dominant modes of the synoptic scale variability in the lower stratosphere. The differences are in part due to the filtering of the waves by the Quasi-Biennial Oscillation. For instance, the RGWs are better represented in models with a QBO, simply because these waves propagate better when the zonal mean zonal wind is positive in the low stratosphere, a situation that is never reached in the models without a QBO we have analyzed. Also, and between the models with a QBO, the properties of the RGWs can be quite different. As an illustration and in one model, the RGWs packets travel over 180° of longitude during their life cycle, whereas in a second one they essentially stays at the same place.

For the Kelvin waves, the contrast between the models is less pronounced, at least concerning the qualitative behavior of their life-cycle. Their amplitude nevertheless largely varies from one model to the other and is often overestimated, when compared to reanalysis for instance. These results tell that the lower equatorial stratosphere is place where the day to day variability is not well represented in models.