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# Tropical latent heating, large-scale circulation and the MJO in MPI-ESM1.2

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Tropical diabatic heating is a key driver of the large-scale circulation and convectively coupled equatorial waves, in particular, a top-heavy heating profile is discussed to be connected with the Madden-Julian-Oscillation (MJO). We explore experiments performed with two versions of the MPI-ESM1.2, which mainly differ w.r.t. parameters of the convection scheme. One experiment reveals a good mean climate, a weak MJO and a mid-heavy latent heating profile (maximum around 550 hPa). The other experiment shows a striking MJO-like behavior and a top-heavy profile (maximum around 450 hPa), however, a worse mean climate than the former experiment. We explore the tropical latent heating (LH) of the two experiments over the ocean, and how the LH is controlled by environmental factors, namely the SSTs and the large-scale circulation, expressed by the vertical velocity in 500 hPa ($\omega$500). We address the question, how and why the LH between the experiments differs, and whether the links with the environmental quantities are similar to what is seen in nature. For evaluation of the LH, the satellite retrieved TRMM PR Spectral Latent Heating is used.
The final conclusion of this study is the following: given that a top-heavy LH profile is necessary for a good MJO representation, and as long as a top-heavy profile can only be achieved by a worse large-scale circulation, a good MJO is generally linked to a worse mean state.