

Shallow Heating of the MJO

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Abstract

The role of shallow latent heating (below the freezing level) in the MJO is discussed in the context of numerical modeling. A GCM with a capacity of producing the salient feature of the MJO (eastward propagating, planetary scale, and intraseasonal spectral peak) was used to test the hypothesis that shallow heating is essential to the MJO. The model was run with its convective heating profile artificially modified so that its peak always tended to occur in the upper, mid, or lower troposphere. It turned out that only when the convective heating peak was confined to the mid or lower troposphere, could the MJO be reproduced by the model. When the heating peak is confined to the upper troposphere, only westward propagating intraseasonal signals are produced. It is argued that shallow heating is at least as important as, if not more than, deep (top-heavy) heating to the MJO. Possible interpretations for the role of shallow heating in the MJO are discussed.