

The MJO simulation biases in the kilometre-scale models and the contribution of moisture

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This study investigates the Madden-Julian Oscillation (MJO) simulation biases within kilometre-scale models, focusing on moisture's role. Using a 40-day MJO case simulation from the K-scale project in the Met Office, we examined MJO propagation through precipitation anomalies. Current findings reveal that the kilometre-scale Unified Model (UM) is highly sensitive to boundary conditions, which, when improved, enhances MJO simulation. The RAL3.2 configuration of the UM experiment at 4.4 km resolution effectively simulates MJO propagation and improves mean moisture states compared to global UM and the other k-scale experiments in using other configurations. However, biases in lower troposphere moisture persist, likely due to the planetary boundary layer (PBL) scheme.