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Oral
This study evaluates the impact of vertical resolution on the biases affecting the prediction of MJO teleconnections in two versions of the NOAA Unified Forecast System (UFS): prototype 6 (UFS5) and prototype 6 (UFS6). The key difference between the two prototypes is in the number of vertical layers (127 in UFS6 vs. 64 in UFS5) and model top (80 km in UFS6 vs. 54 km in UFS5).

With respect to ERA-Interim, the global teleconnections of the MJO to the Northern Hemisphere 500hPa geopotential height show similar biases over the North Atlantic and European sectors in both prototypes. UFS6 has larger bias over Eurasia but smaller bias over North America, compared with UFS5. UFS5 has smaller bias than UFS6 when averaged over the Northern Hemisphere. Likewise, the two prototypes show similar biases in the extratropical jet.

Both UFS prototypes simulate quasi-stationary waves that are qualitatively similar to reanalysis: a ridge over the North Atlantic and Western North America, and a trough over East Asia and Hudson Bay. However, the ridge over Western North America is too weak in both prototypes, a bias similar to that evident in many S2S Models. The too-weak Western North American ridge and Hudson Bay trough have implications for wavenumber-2.

Overall, the two prototypes show similar performance in predicting the basic states in the troposphere and stratosphere. Thus the increase in vertical resolution and model top has a marginal impact.
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