

Predictability of the Reflection Event of Stratospheric Planetary Waves in February 2014

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A series of reforecast experiments is conducted to reveal the predictability and downward influence of a reflection event of stratospheric planetary waves in February 2014, which recorded the highest level of the downward propagation of the wave activity. The reflection is predictable from at least one week in advance. It is found that the skill of forecasts with a prediction period around the predictability limit crucially depends on whether planetary waves are reflected or absorbed in the stratosphere. Composite analyses also reveal that the persistence of the tropospheric wave source in the eastern hemisphere is a key in determining the propagating property of stratospheric planetary waves. When the reflection occurs in association with a weak persistence of the wave source, the subsequent downward propagating wave from the stratosphere enforces anomalous tropospheric circulation in the western hemisphere.

Key words: predictability, ensemble forecast, planetary wave