



Predictability of stratospheric sudden warming event: A case study of 2013 event

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The predictability of SSW event, which has occurred on January 7th of 2013, is examined by integrating an operational weather prediction model, GRIMs, for 30 days with varying vertical resolutions and surface boundary conditions. This event was preconditioned by vertical propagation of wavenumber-one wave across the tropopause and caused by subsequent amplification of wavenumber-two wave that results in vortex split. These features are well predicted in the model with 64 vertical levels, but significantly underestimated in the model with 42 or 28 levels. Quantitatively, the high-top model predicts the event at 10-day lead while the low-top model shows the maximum lead of 5 days. This result is only weakly sensitive to the surface boundary condition, indicating that precise initial condition with high vertical resolution is important for the extended prediction of SSW event. Overall findings are compared with the results from 5 operational weather prediction systems that have participated in the SPARC/SNAP project.