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Predictability of 2013 SSW in multiple operational forecasting systems

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To estimate the predictability of a major Sudden Stratospheric Warming (SSW) is performed using major NWP systems. Anomalous upward propagating planetary wave activity was observed during the end of December 2012. This wave activity was followed by a rapid deceleration of westerly circulation around January 2. On January 7 2013 the zonal mean zonal wind at 60N and 10hPa reversed from westerly to easterly. This dynamical activity was followed by an equatorward shift of the tropospheric jet stream and a high pressure anomaly over the North Atlantic. This resulted in a severe cold conditions in the UK and Northern Europe. In most of the models surveyed here the SSW event was predicted 10 days in advance. However, only a few ensemble members in most models predicted weakening of westerly wind when initialized 15 days in advance. Dynamical analysis of the event show that this event was caused by polar vortex preconditioning by anomalous planetary wave-1 amplification in the stratosphere followed by anomalous wave-2 amplification. The models have some success in simulating wave-1 activity 15 days in advance but generally failed to produce the triggering wave-2 activity during the final days of the event. This presentation will show a detailed data analysis of integrated and will show that the models have reasonably good skill in forecasting tropospheric blocking features that stimulate wave-2 amplification in the troposphere but have limited skill in transferring and amplifying this tropospheric energies transfer into the stratosphere.