



The Sudden Stratospheric Warmings of Winter 2012/13, and the Potential Impact of ARISE Measurements on their Forecasting

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Sudden Stratospheric Warmings (SSWs) are the stratosphere's most dramatic events. Whilst their onset can be accurately predicted with numerical weather prediction (NWP) models, the timing and nature of the recovery is less certain.

This study examines the evolution of the 2012/2013 Northern Hemisphere SSWs, comparing the forecasting of their onset and recovery, to infrasound, airglow, and LIDAR observations from the ARISE (Atmospheric Dynamics Research Infrastructure in Europe) winter campaign. At present NWP models suffer from a paucity of observations above 30km, contributing to the uncertainty in SSW forecasts. The focus of this study is to identify at what altitude ARISE technologies can potentially make the greatest contribution to NWP, in the context of sudden stratospheric warmings.

At the time of writing, there have been two SSWs in the 2012/13 season: a vortex displacement (whose onset was around 25th December 2012); closely followed by a vortex split (onset around 6th January 2013). Forecasts of the latter onset are of particular interest, because of the closeness in time of the two events.