

# Reanalyses performance in representing major sudden stratospheric warmings

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Major sudden stratospheric warmings (SSWs) represent one of the most abrupt phenomena of the boreal wintertime stratospheric variability and constitute the clearest example of the stratosphere-troposphere coupling. A good representation of SSWs in climate models is required to reduce their biases and uncertainties in future projections. The ability of models to reproduce these phenomena is usually assessed with just one reanalysis. However, the number of reanalyses has increased in the last decade and their own biases can affect the model evaluation.

In this study, we compare the representation of the main aspects of SSWs across reanalyses. The examination of their main characteristics in the pre- and post-satellite periods reveals that reanalyses behave very similarly in both periods. However, the spread of results is wider in the pre-satellite period than afterwards, particularly for the NCEP/NCAR reanalysis. The good agreement among reanalyses is also found for triggering mechanisms, tropospheric precursors and surface fingerprint and all datasets reproduce similarly the specific signatures of wavenumber 1 (WN1) and wavenumber 2 (WN2) SSWs. Differences in blocking activity prior to WN1 and WN2 events between reanalyses are much smaller than between blocking definitions.

Key words: stratospheric sudden warmings, reanalyses intercomparison, S-RIP.