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Defining Sudden Stratospheric Warmings

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The general form of the definition for Sudden Stratospheric Warmings (SSWs) is largely agreed to be a reversal of the temperature gradient and of the zonal circulation polewards of 60° latitude at the 10 hPa level, as developed by the World Meteorological Organization (WMO) in the 1960s and 1970s. However, the details of the definition and its calculation are ambiguous, resulting in inconsistent classifications of SSW events. These discrepancies are problematic for understanding the observed frequency and statistical relationships with SSWs, and for maintaining a robust metric with which to assess wintertime stratospheric variability in observations and climate models. To provide a basis for community-wide discussion, we examine how the SSW definition has changed over time and how sensitive the detection of SSWs is to the definition used. We argue that the general form of the SSW definition should be clarified to ensure that it serves current research and forecasting purposes, and propose possible ways to update the definition.