

Stratosphere-troposphere coupling processes on S2S and longer timescales

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Knowledge of the state of the stratosphere has the potential to enhance predictability of the troposphere on sub-seasonal to seasonal timescales and beyond. Here, we provide a broad overview of our current understanding of how the stratosphere couples to the troposphere in the tropics and extratropics on a wide range of timescales, via processes such as sudden stratospheric warmings, the Madden-Julian Oscillation, or the El Niño-Southern Oscillation. We briefly discuss progress to date in trying to harness stratosphere-troposphere coupling to enhance predictability on the sub-seasonal to seasonal (S2S) timescale, a key focus of the WCRP/SPARC Stratospheric Network for the Assessment of Predictability (SNAP) project. Finally, we examine open questions and provide some suggestions on where and how improved understanding and simulation of stratosphere-troposphere coupling is most likely to lead to improved skill.

Key words: predictability, ENSO, sudden stratospheric warming, S2S, teleconnections