



## **The stratospheric version of LMDz: dynamical climatologies, Arctic oscillation, and impact on the surface climate.**

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A climatology of the stratosphere is determined from a 20-yr integration with the stratospheric version of the Atmospheric General Circulation Model LMDz.

This poster describes the model and some aspects of its radiative-dynamical climatology. Standard first order diagnostics are presented but emphasis is given to the model ability to reproduce the low frequency variability of the stratosphere in the winter Northern Hemisphere. In this model, the stratospheric variability is dominated at each altitudes by patterns which have some similarities with the Arctic Oscillation (AO). For those patterns, the signal sometimes descends from the stratosphere to the troposphere.

In an experiment where the parameterized orographic gravity waves that reach the stratosphere are exaggerated, the model stratosphere in the NH presents much less variability. Although the stratospheric variability is still dominated by patterns that resemble to the AO, the downward influence of the stratosphere along these patterns is near entirely lost. In the same time, the persistence of the surface AO decreases, which is consistent with the pictures that this persistence is linked to the descent of the AO signal from the stratosphere to the troposphere. A comparison between the stratospheric version of the model, and its routinely used tropospheric version is also done. It shows that the the introduction of the stratosphere in a model that already has a realistic AO, can lead this model to overestimate the actual influence of the stratospheric dynamics onto the surface AO.