



A distinctive dynamical feature of the extra-tropical lowermost stratosphere

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From a dynamical standpoint the lowermost stratosphere is viewed for the most part as a quasi-passive and responsive region. The picture includes the transmission of planetary-scale waves through it from the troposphere into the upper stratosphere, and the obverse with annular-like features of the upper stratosphere manifesting themselves in this region prior to their appearance in the troposphere. Likewise the lowermost stratosphere is the receptor of mass (and chemical constituents) transported into it by the wave-forced mean circulation of the overlying stratosphere, and it also exchanges these ingredients with the underlying troposphere via large-scale breaking baroclinic waves generated on the region's lower boundary.

In this study evidence is adduced using the ERA40 data set that this passive portrayal of the dynamics is incomplete. It is shown that for a significant part of the year the mean structure of the extra-tropical lowermost stratosphere is:- (a) conducive to the region being able to self-generate large and / or meso-scale flow features, and (b) capable of influencing the nature of and response to external forcing imposed upon it.