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Dynamics and climatology of a distinctive feature of the extra-tropical lowermost stratosphere

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Evidence is presented, based the ERA40 data set, that the extra-tropical lower stratosphere is a self-generating dynamically active region. It is shown that, for a significant part of the year, the mean PV (potential vorticity) structure of the extra-tropical lowermost stratosphere in the northern hemisphere is consistent with the region being dynamically unstable and can induce large and / or meso-scale flow features seminal for stratosphere-troposphere coupling. An index is developed to explore seasonal and inter-annual variability of this dynamically distinct mean annular structure and comparisons are made with its southern hemispheric counterpart.