

Vertical motions inferred from ground-based airglow measurements as an indicator of atmospheric coupling

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Correlated hydroxyl airglow emission rate and temperature variations are a strong indicator of vertical adiabatic motions and are well-known to airglow observers of atmospheric gravity waves. At Resolute Bay, 74° N in Northern Canada, these OH airglow correlations are found to occur more generally, during a month, an entire winter, and even from winter to winter. The interpretation as vertical motions is confirmed by satellite measurements of airglow altitude, made with the WINDII instrument on the UARS spacecraft. One natural question is as to the altitude extent of these vertical perturbations. In this presentation, the extension to lower altitudes is investigated by examining correlations with stratospheric temperatures. In addition, higher altitude correlations are examined by the observation of atomic oxygen airglow emission from the thermosphere. The results of four years of observations at Resolute Bay are described and discussed.