

Dynamical Instability in the MLT Region Related to Strong Temperature Gradients

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Na LIDAR temperature measurements were taken successfully from 2007 to 2009 in the mesopause region over São José dos Campos (23.1 ° S, 45.9° W). Strong gradients on this vertical temperature profiles are often observed. Previous work has shown that temperature gradient of at least -8K/km is required concomitantly with the wind shear in order to generate dynamical instability in the MLT region. We have studied vertical wind shear related to atmospheric tides, inferred by meteor radar, with the aim of analyzing instability generation. Two years of simultaneous data, wind and temperature, were used in this analysis which represents 79 days, totalizing 589 hours of simultaneous observations. We realized that the condition of the local Richardson number (Ri) dropping below the critical value of dynamic instability ($Ri \leq 1/4$) is often reached, more than 98% of the analysed cases. Moreover, in some of these cases the Brunt-Vaissalla frequency changes its value abruptly reaching values about 4 times smaller than the standard ones. This is an evidence of turbulence or possible local Gravity Wave source at the Mesosphere and Lower Thermosphere region.