

CERTAIN ANALYSIS ON MESOSPHERE- THERMOSPHERE COUPLING

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ABSTRACT

In this paper, the process of growth wave has been studied. Saturation and interaction with mean flow as the waves propagate through the atmosphere have been developed. The internal atmospheric gravity have been generated mainly in the troposphere grow in amplitude as they propagate upward in the absence of any dissipation. The turbulent diffusion and mean flow acceleration accompanying the gravity wave saturation are to be explained.

Keyword - Growth Wave, Turbulent Diffusion, Means Flow Acceleration, Troposphere

I. INTRODUCTION

Mesosphere is the region of decreasing temperature with altitude and is the prone of turbulence. The transition level from mesosphere to thermosphere is called mesopause and coldest region of the earth atmosphere system. Atmospheric heating, cooling and energy transportation in the upper mesosphere and the lower thermosphere are very important. Atmospheric waves originating mainly in the troposphere grow in amplitude as they propagate into the thermosphere and carry momentum and energy into that region. The thermosphere waves are the important dynamics coupling agents between the lower and upper atmosphere. In above terms, the solar energy input to thermosphere is small compare to the input to the region below 90 km which is in and UV and visible wave length range of the solar radiation. For this reason, any small leakage of energy from the lower region to thermosphere would have profound effect on the thermosphere.

In the followings, the process growth wave, saturation and interaction with mean flow as the waves propagate through the atmosphere are obtained.

II. GRAVITY WAVE GROWTH AND SATURATION

The simplest theory, conceptually, of gravity waves saturation and breakdown is the linear saturation theory developed by Lindzen. The saturation mechanism though to be most important in the turbulent breakdown of convectively unstable regions due to the differential advections of more dense air by gravity wave motion. The resulting turbulent diffusion reduces the wave amplitude to that value that permits continued generation of turbulence. The internal atmospheric gravity waves generated mainly in the troposphere grow in amplitude as they propagate upward in the absence of any dissipation. As the wave propagates upwards, it propagates into regions of decreasing density.