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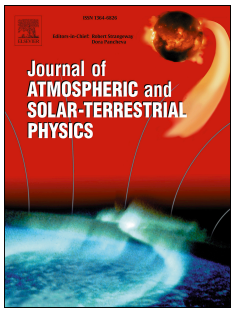


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# PROPAGATION OF STATIONARY PLANETARY WAVES TO THE THERMOSPHERE AT DIFFERENT LEVELS OF SOLAR ACTIVITY.

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Numerical modeling of changes in the global atmospheric circulation and characteristics of stationary planetary waves with zonal wavenumbers 1 – 4 is performed, taking into account the effects of changes in solar activity at altitudes above 100 km. The middle and upper atmosphere model (MUAM) is utilized to simulate the general circulation and planetary waves at altitudes 0 - 300 km, averaged over 12-member ensemble of model runs for values of the solar radio flux at the wavelength of 10.7 cm corresponding to the high and low levels of solar activity. The ionospheric conductivities and their latitudinal, longitude and temporal dependences are taken into account in the MUAM. Calculations for January-February in the thermosphere showed larger eastward wind velocity at altitudes above 130 km at high solar activity level. In the thermosphere, the amplitudes of planetary waves decrease at most latitudes at high solar activity level. Simulated changes in the atmospheric refractivity index and the Eliassen-Palm flux correspond to the obtained changes in planetary waves amplitudes. Changes in the conditions of propagation and reflection of stationary planetary waves caused by impacts of solar activity on the thermosphere can influence atmospheric circulation in a broad altitude range including the middle atmosphere.

## 1. Introduction

Large-scale wave disturbances in the atmosphere contribute to the energy transfer between different atmospheric layers and play significant role in the formation of the general circulation of the middle and upper atmosphere (Holton, 1975). According to Haynes et al. (1991), wave disturbances in the upper mesosphere and thermosphere are the most prominent driving force affecting the extratropical circulation. Due to the rapid development of computer technology and the improvement of numerical models of the atmospheric general circulation, interest in a more accurate study of the dynamical and thermal effects produced by wave motions, in particular, by planetary waves (PWs) at different atmospheric layers is constantly