



Tidal wind as a possible link of coupling between atmospheric waves activity and sporadic E formation

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The horizontal tidal wind in the mesosphere lower thermosphere region (MLT) is considered as a source of atmospheric gravity waves (AGWs) and vortical type perturbations generation. It is shown that at mid-latitude these atmospheric waves, evolving in the tidal wind, can lead to vertical convergence of heavy metallic ions of this region and Formation of sporadic E (Es) layer.

The process of sporadic E formation by short-period AGWs (close to Bunt-Vaisala period) and by the stationary type vortical perturbations with the same spatial scale, excited in the horizontal shear flow is demonstrated using numerical simulations. The possibility of oscillation of Es layers electron/ions density by period less than BV period under influence of short-period AGWs is shown and the possible coupling of these processes with quasi-periodic echoes is also noted. In our numerical experiment the mid-latitude nighttime Es layers formed under influence of these atmospheric waves, which are possibly generated by horizontal tidal wind, mostly move downward, this is an observed phenomena.

It is noted that investigation of sporadic E formation by atmospheric waves evolving in the tidal wind is important for study of the *in situ* developing processes in the lower thermosphere determining atmosphere-ionosphere dynamical coupling as well as for revealing their possible dynamical coupling with lower atmosphere.

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