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The global QBO effect on the MLT-region dynamics with planetary wave scales as seen from the *Es*-layer data analysis

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According to wind-shear theory, a considerable component of *Es*-layer intensity variations may be caused by wind system changes at mesosphere–lower thermosphere (MLT) heights. Several recent papers provided evidence supporting such an influence. Thus, *Es*-layer intensity can play the role of a certain detector of significant vertical wind gradient at the MLT-heights. Therefore, discovered 4–30-day oscillations of *Es*-layer highest frequency (f_oEs) may indicate the influence of planetary wave dynamics of neutral atmosphere on ionospheric sporadic ionization.

A complex research in *Es*-layer dynamics with planetary wave periods (2–32 days) is conducted. The aim of the research is getting a global picture of wave dynamics in the Northern hemisphere and finding out a possibility of QBO-effect on the MLT-region at different latitudes. f_oEs measurement data from more than one hundred ionosondes for 1965–1989 is used in this study. Correlation analysis between the annual averaged values of zonal wind in the equatorial stratosphere and the interpolated values of f_oEs and 4–24-day f_oEs oscillations showed significant correlation in the sector of longitude between 30° and 270° and latitude between 15°N and 75°N. A unique algorithm for detecting spatial motion is used to obtain zonal and meridional projections of local displacement of the 4–24-day f_oEs wave perturbation field in the Northern hemisphere. A connection between the annual prevailing directions of 4–24-day f_oEs wave perturbations and the QBO phase (eastern or western) of atmospheric circulation is revealed on the basis of correlation analysis. The strongest correlation is discovered in the area around 60°N, 120°E in the case of filtered 16-day f_oEs oscillation field.