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Comparative studies of the plasma turbulence in the different regions of the ionosphere- discussion of the results from DEMETER satellite

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Plasma turbulence is a very common phenomenon in the Earth's ionosphere. There are difference sources of it, but the generally the nonlinear developing of the plasma instabilities is a main cause of its presence. In the ionosphere there are several regions with conditions favorable for the generation and developing of the plasma instabilities. The main regions in which the turbulence has been registered are: equatorial ionosphere, auroral oval, polar cusp, ionospheric trough and also regions over epicenters of the earthquakes. The turbulence is characterized as multi-scale nonlinear and intermittent process. We will present results of electric field wave form analysis using wavelet and bispectral methods for selected strong earthquakes and for crossings of the polar cusp, equatorial region and ionospheric trough. All data used in our presentation were gathered by ICE experiment onboard DEMETER satellite. These methods allow to find the energy cascade being a main mechanism of the turbulence developing. Plasma turbulence can be described by the shape of the spectra, the probability distribution function and its moments- kurtosis and skewness. The main goal of our presentation is comparison of these parameters for the turbulence over seismic regions and other ionospheric sites with turbulence.