



Statistical correlation of spectral broadening in VLF transmitter signal and low -frequency ionospheric turbulence from observation on DEMETER satellite

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It was recently found the effect of VLF transmitter signal depression over epicenters of the large earthquakes from observation on French DEMETER satellite. A possible explanation is nonlinear interaction of VLF signal and low-frequency ionospheric turbulence with subsequent spectrum broadening of both waves. In our earlier papers we published some connection of the low-frequency ionospheric turbulence and seismicity. The main goal of this research is the demonstration of VLF signal - ionospheric turbulence spectrum broadening correlation using statistics of DEMETER data during about two years period (~2500 orbits). We show several clear examples of VLF signal modulation by IC (ion-cyclotron) waves. In result of our statistical analysis we have found the intensification of VLF signal broadening in the zones of increased IC turbulence ($F=200-800$ Hz) and some total correlation in the two types of spectrum broadening. We discuss also the theoretical model of the interaction. The work was supported by ISTC under Grant 2990.