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Dynamics of relativistic electrons in the region of outer radiation belt, caused by solar events

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The results of the observation of short-term and long-term variations of relativistic electron flux in the region of outer radiation belt in satellite experiments ARINA and VSPLESK are presented. Scintillation spectrometers ARINA (on board the Resurs-DK1 Russian satellite, since 2006) and VSPLESK (on board the International Space Station, since 2008), developed by MEPHI, provide continuous measurements of high-energy particle fluxes in low-Earth orbits, detect and identify electrons and protons with energies in 3-30 MeV and 30-100 MeV ranges correspondingly, give the possibility to study energy spectra, pitch-angle distributions and time profiles of particle fluxes. Additionally to the main objective of experiments (search for high-energy charged particle bursts in the magnetosphere) detail analysis of experimental data on relativistic (5-7 MeV) electrons was fulfilled. It was revealed a large variability of flux of such electrons in zone of the outer radiation belt and was shown that observed effects in electron flux were caused by solar flares and coronal mass ejections. In particular, the period of significant (greater than hundreds times) changing the flux of relativistic electrons in this region during the several months of 2012 was presented in the work. Comparison between ARINA/VSPLESK experimental data on relativistic electrons and the results of Van Allen Probes was carried out.

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319

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