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Time variations of proton flux in Earth inner radiation belt for 2006-2015 years based on the PAMELA and the ARINA data

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The PAMELA and the ARINA experiments onboard satellite RESURS-DK1 are carried out since 2006 up to now. PAMELA instrument in the first place is intended to measure of high energy antiparticles in cosmic rays while main purpose of the ARINA instrument is study of high-energy charged particle bursts in the magnetosphere. Both these experiments have possibility to study protons in the inner radiation belt. Complex of these two instruments covers proton energy range from 30 MeV up to trapping limit ($E \sim 2$ GeV). Measurements with PAMELA and ARINA include both last minimum and maximum of solar cycle. It is important because existing empirical radiation belt models do not able to calculate trapped particle fluxes taking into account solar activity changing, e.g. widely used AP-8 model allows to evaluate proton fluxes just in two cases: for minimum or maximum of a solar activity. In this report we present temporal profiles of proton flux in the inner zone of the radiation belt ($1.11 < L < 1.50$, $0.18 < B < 0.22$ G for 2006 - 2015 year) based on PAMELA and ARINA measurements. Dependence of proton fluxes on degree of solar activity were studied for various phases of 23/24 solar cycle. At that it was shown that proton fluxes of energies >30 MeV at the solar minimum several times greater than at the solar maximum.

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