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Observation of Radiation Environment on ISS during Solar Particle Event in March 2012

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The Liulin-5 charged particle telescope observes the radiation conditions in the spherical tissue-equivalent phantom of MATROSHKA-R international project on the International Space Station (ISS) since June 2007. In this paper attention is drawn to the results from measurements of the radiation parameters during the Solar Particle Event (SPE) occurred 7-8.03.2012. During that SPE the solar particles penetrated the ISS orbit at high geographic latitudes in the regions of the south and north Earth magnetic poles and at 3< L they caused particle flux and dose rates increase in all three detectors of Liulin-5, located at 40, 60 and 165 mm depths along the phantom's radius. The maximum flux at 40 mm depth observed outside the inner radiation belt in the region of South Atlantic Anomaly (SAA) during that SPE reached 7.2 part/cm2.s and the dose rate reached 107.8 μGy/hour. The total dose outside SAA received during the SPE was 259.9 μGy.
Compared are the dose rates, particle fluxes, deposited energy spectra, linear energy transfer spectra, obtained radiation quality factors and dose equivalent values during the SPE and during quite conditions.
Compared are data from Liulin-5 charged particle telescope and from other particle and radiation detectors in space during that SPE.
Compared are the results from radiation measurements on ISS during SPE of March 2012 and data from SPE radiation environment investigations on Mir manned space station in 1989-1993 time periods, conducted with Liulin type dosemeters.