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The background model estimation for scintillation detectors onboard low altitude and high inclination satellites in the low energy gamma region using the AVS-F apparatus data

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The gamma-quanta background count rate model in the energy range from 0.1 MeV up to several MeV for high inclination satellites is presented. The AVS-F instrument (Amplitude-Time Spectrometry of the Sun) was installed onboard the specialized automatic station CORONAS-F functioning in time interval since July, 2001 up to December, 2005 on the orbit with initial parameters: altitude ˜500 km, inclination 82.5°. The device was intended for the solar flares hard X-ray and gamma emission characteristic studies. The background count rate time profile of AVS-F instrument analysis allows concluding the possibility of its approximation by 4-5 order polynomials in equatorial regions of the satellite orbit, and 1-3 order polynomials or constant in polar caps. We obtain polynomial's coefficients for equatorial regions similar within errors intervals for the same geomagnetic indexes regions. The example of use of this method for gamma-emission background estimation for RHESSI data corrected to registration efficiency, detectors size and satellite altitude (orbit parameters were: altitude ˜600 km, inclination 38° in the beginning of its operation in January, 2000) is discussed.

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