JEM-X background models

Background and determination of its components for the JEM-X X-ray telescope on INTEGRAL are discussed. A part of the first background observations by JEM-X are analysed and results are compared to predictions. The observations are based on extensive imaging of background near the Crab Nebula on revolution 41 of INTEGRAL. Total observing time used for the analysis was 216 502 s, with the average of 25 cps of background for each of the two JEM-X telescopes. JEM-X1 showed slightly higher average background intensity than JEM-X2. The detectors were stable during the long exposures, and weak orbital phase dependence in the background outside radiation belts was observed. The analysis yielded an average of 5 cps for the diffuse background, and 20 cps for the instrument background. The instrument background was found highly dependent on position, both for spectral shape and intensity. Diffuse background was enhanced in the central area of a detector, and it decreased radially towards the edge, with a clear vignetting effect for both JEM-X units. The instrument background was weakest in the central area of a detector and showed a steep increase at the very edges of both JEM-X detectors, with significant difference in spatial signatures between JEM-X units. According to our modelling, instrument background dominates over diffuse background in all positions and for all energies of JEM-X.

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