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Particle tracking in wide field-of-view with miniaturized pixel detector arrays for space weather and space radiation research

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Hybrid semiconductor pixel detectors Timepix and Timepix3 provide quantum sensitivity, per-pixel spectrometry, noiseless detection and particle tracking in wide field-of-view. Array architectures enhance the resolving power and angular resolution. Miniaturized arrays are developed for deployment on board spacecraft in space. Low-power radiation monitors for telecommunication satellites in GEO. A large-area focal-plane imager for astrophysics X-ray observation of stellar objects on board a Cubesat in LEO. Stack arrays of pixel detectors for directional detection of gamma rays and mapping of energetic charged particles in wide field-of-view. The platforms feature novel on-board data processing for autonomous operation. We describe the data products (LET-spectra, particle fluxes, dose rates, directional- time- and location-correlated distributions) and results of testing and calibrations in well-defined radiation fields. Development in frame of European Space Agency ESA Contract.

Secondary track (number)

07

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