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e-Astrogam Mission Polarimetric Optimization

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High-energy astrophysics polarimetry may greatly benefit from e-ASTROGAM (enhanced ASTROGAM) mission proposal legacy, since so far limited polarimetric measurements were performed in this domain, measured by instruments that were not designed or optimized for polarimetry. This space observatory is composed by a Silicon tracker, a calorimeter, and an anticoincidence system, operating in the 0.3 MeV up to 3 GeV energy band. The Compton (up to ~2 MeV) polarimetric potential of e-ASTROGAM mission concept was analysed by mass model simulations using MEGALib simulation tools [3], for different tracker, calorimeter and anticoincidence system configurations as well as for different the detector types (scintillators and semiconductors) within the mission mass and power margins. Background and main gamma-ray sources were modeled. Polarimetric modulation factor and Minimum Detectable Polarization was estimated for each source within the mission time frame.

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