

Simulation of a Compton-pair imaging calorimeter and tracking system for the next generation of MeV gamma-ray telescopes.

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The astrophysical community is currently focusing its efforts in the development of a new generation of gamma-ray telescopes to detect low-energy photons in the MeV-GeV energy range, operating both in the Compton and pair conversion regimes. The reconstruction of the incident photons energy and direction is not straightforward, as the range of secondary particles produced by photon interactions is usually short. We propose a detector consisting of a tracker system based on scintillating fibers and of a Compton-pair imaging calorimeter made of CsI(Na) crystals coupled to wavelength shifting (WLS) fibers read out by Silicon Photomultiplier (SiPM) arrays. We have developed a dedicated simulation code to study the performance of this detector. The simulation takes into account the optical photon production and propagation inside the fibers and is used to optimize the fiber geometrical and optical properties and the design of the readout system.

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No, this is an entirely new submission.

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Authors: SERINI, Davide (Universita e INFN, Bari (IT)); ALTOMARE, Corrado (INFN - National Institute for Nuclear Physics); DI VENERE, Leonardo (Universita e INFN, Bari (IT)); MAZZIOTTA, Nicola (Universita e INFN, Bari (IT)); LOPARCO, Francesco (Universita e INFN, Bari (IT)); GIORDANO, Francesco (INFN); Dr PILLERA, Roberta (INFN Bari)

Presenter: SERINI, Davide (Universita e INFN, Bari (IT))

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