

Anticoincidence Detector (ACD) for GLAST

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The Gamma-ray Large Area Space Telescope (GLAST) is a proposed intermediate-class mission for high-energy gamma-ray astronomy. The Anticoincidence Detector (ACD) for the Silicon GLAST configuration uses plastic scintillator tiles with embedded waveshifting fibers and phototube readout. GLAST will be studying gamma radiation up to 300 GeV. Gamma-rays of such high energy create a huge number of secondary particles and photons in the calorimeter of the telescope; some of them backscatter and hit the ACD, which can cause self-veto and reduce dramatically the efficiency of the instrument for the detection of high energy photons. Measurements at CERN and SLAC and simulations show that the proposed segmentation of the ACD can reduce the self-veto due to backscatter to be <10-20% even at the highest energies (~ 300 GeV) while still achieving a high efficiency (0.9997) for detecting charged particles. The design of this system, its simulated performance, laboratory measurements, and beam test results are presented.