FiberGLAST: A High-Energy Gamma-Ray Telescope for the GLAST Mission based on Scintillating Fiber Detectors

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FiberGLAST is one of two main-instrument concepts being studied for NASA's Gamma-ray Large Area Space Telescope (GLAST) mission. It uses a large volume ($\sim$3 m^3) of scintillating fiber detectors combined with passive conversion material to image gamma-ray induced showers in the energy range $\sim$10 MeV to 300 GeV. In addition to meeting the formidable GLAST science performance requirements, FiberGLAST offers exceptionally large effective detection area (>1 m^2) over a wide field-of-view (>70 deg HWHM). These characteristics make it well-suited to perform a sensitive all-sky survey and to monitor a large population of variable sources, such as active galactic nuclei and gamma-ray bursts. We present an overview of the FiberGLAST instrument concept design and report results on hardware development, accelerator beam test results, and instrument performance simulations.