

AGILE: Instrument Overview

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The AGILE scientific payload is based on the state-of-the-art and reliably developed technology of solid state silicon detectors. The instrument consists of a silicon-tungsten tracker ($0.7 X_0$), a cesium iodide mini-calorimeter ($1.5 X_0$), an anticoincidence system made of segmented plastic scintillators, fast readout electronics and processing units. The instrument is very light (~ 60 kg) and effective in detecting and monitoring gamma-ray sources within a large field of view.

The baseline AGILE instrument has been designed to obtain: (1) an excellent imaging capability in the energy range 100 MeV-50 GeV, improving the EGRET angular resolution by a factor of 2, and achieving a source location accuracy $\sim 5' - 20'$ for intense sources; (2) a wide field-of-view, allowing simultaneous coverage of $\sim 1/5$ of the entire sky per pointing; (3) the shortest deadtime ever achieved ($\leq 200\mu s$) for gamma-ray detection (a factor of ~ 500 better than that of EGRET), and a trigger based exclusively on silicon plane detectors; (4) a good sensitivity for point sources, comparable to that of EGRET for on-axis sources, and substantially better for off-axis sources; (5) a good sensitivity to photons in the energy range 30-100 MeV, obtained by efficient hardware and triggering capabilities. AGILE will be able to provide spectral information with limited resolution, typically $\Delta E/E \leq 1$ at 100 MeV and $\Delta E/E \sim 2$ at 1 GeV.

An X-ray detector, Super-AGILE, sensitive in the 10-40 keV band will provide hard X-ray imaging and moderate spectroscopy simultaneously with the gamma-ray detector. Imaging will be achieved by an ultra-light coded mask imaging system positioned on top of the gamma-ray tracker in combination with silicon detector tiles properly arranged on the first tracker plane.