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Super-TIGER and the search for Galactic Cosmic-Ray Origins

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Super-TIGER is a large area (5.4 m^2) balloon-borne instrument designed to measure cosmic-ray nuclei in the charge interval 30 <= Z <= 42 with individual-element resolution and high statistical precision, and make exploratory measurements through Z = 56. These measurements will provide sensitive tests of the emerging model of cosmic-ray origins in OB associations and models of the mechanism for selection of nuclei for acceleration. Furthermore, Super-TIGER will measure with high statistical accuracy the energy spectra of the more abundant elements in the interval 10 <= Z <= 28 at energies 0.8 < E < 10 GeV/nucleon to test the hypothesis that nearby micro-quasars could superpose features on the energy spectra.
Super-TIGER, which builds on the heritage of the smaller TIGER, was constructed by a collaboration involving WUSTL, NASA/GSFC, Caltech, JPL and U Minn. It was successfully launched from Antarctica in December 2012, collecting high-quality data for over one month. Particle charge and energy were measured with a combination of plastic scintillators, acrylic and silica-aerogel Cherenkov detectors, and a scintillating fiber hodoscope. Details of the flight, instrument performance, data analysis and preliminary results of the Super-TIGER measurement will be presented.

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