

Research in Astrophysics from Space (E)  
Origins of Cosmic Rays: Resolving Hess' Century-Old Puzzle (E18)

## **DETERMINING COMPOSITION AND PROPAGATION OF GALACTIC COSMIC RAYS WITH TRACER**

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The balloon-borne cosmic-ray detector TRACER (“Transition Radiation Array for Cosmic Energetic Radiation”) was designed to measure cosmic-ray nuclei with single element resolution up to very high energies, and to facilitate a large geometric aperture by using a transition radiation detector. TRACER was launched in two long-duration balloon flights, in Antarctica, in 2003, and subsequently, after significant detector upgrades, from Kiruna, Sweden, in 2006. The data cover the elements from boron ( $Z=5$ ) to iron ( $Z=26$ ), and reach energies of up to 10 TeV per nucleon. We use a simple propagation model to derive the relative cosmic-ray abundances and spectral slopes at the sources. Specific constraints on interstellar propagation come from the relative abundances of secondary elements such as boron. We will present new results on the boron abundance obtained in the 2006 flight. Finally, we will briefly discuss the potential of the TRACER technique for future investigations.