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Composition and Propagation of Galactic Cosmic-Ray Nuclei at High Energies A. OBERMEIER, University of Chicago, M. AVE, P. BOYLE, J. MARSHALL, D. MÜLLER — Information on the sources of cosmic rays must be deduced from observations of composition and energy spectra of the arriving particles, except for the very highest energies, where anisotropies in arrival directions may identify specific sources. TRACER, currently the largest balloon-borne detector, has been designed for direct composition measurements up to the energy regime where air shower experiments begin to provide indirect information. A long duration flight of TRACER from Antarctica (2003) has determined the energy spectra of primary nuclei (O to Fe) up to several 10^{14} eV per particle, and has led to a self-consistent model for the generation and propagation of these particles in the Galaxy. For a second flight launched in Sweden (2006), the instrument was upgraded to allow the lighter elements B,C and N to be included in the measurement. The analysis of this data set is ongoing, and preliminary results with emphasis on secondary and primary abundances will be presented. To further improve the knowledge of cosmic rays in the multi-TeV energy range, additional exposure time is needed. Improvements in charge resolution, e.g. by inclusion of an aerogel Cerenkov counter in TRACER, would allow detailed measurements of all secondary nuclei, including a determination of the sub-iron to iron abundance ratio. We will discuss the scientific prospects of such measurements.

Andreas Obermeier

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