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Co/Ni Ratio Between ~0.8 - 5.0 GeV/nucleon from the TIGER Antarctic Flights

The Trans-Iron Galactic Element Recorder (TIGER) was launched in December 2001 and 2003 from McMurdo, Antarctica and was designed to observe elements ranging from 14 < Z < 40 over an extended energy range. Observations of radioactive isotopes produced during explosive nucleosynthesis such as Ni-59 that decay only through electron capture provide important constraints on the delay between nucleosynthesis and the acceleration of galactic cosmic rays (GCRs). The isotopes of Co and Ni at low energies, in particular, the observations of the 59Ni and 59Co from the Cosmic Ray Isotope Spectrometer (CRIS) on the Advanced Composition Explorer, indicate a significant time delay (>7.6 x 10^4 yr) between GCR nucleosynthesis and acceleration. While TIGER is not able to resolve isotopes, observations of the elemental abundances of Co and Ni at high energies further constrain models for the acceleration and propagation of GCRs. The 2001 & 2003 flights of TIGER lasted a total of ~50 days and collected sufficient statistics to study the Co/Ni elemental ratio over a wide range in energies. We present the elemental ratio of Co/Ni in galactic cosmic rays between ~0.8-5.0 GeV/nucleon and compare these results with previous measurements and models for cosmic-ray propagation.

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