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Abundances of Ultra-Heavy Galactic Cosmic Rays from the SuperTIGER Instrument[1] RYAN MURPHY, Washington University, SUPER-TIGER COLLABORATION — The SuperTIGER (Trans-Iron Galactic Element Recorder) experiment was launched on a long-duration balloon flight from Williams Field, Antarctica, on December 8, 2012. The instrument measured the relative elemental abundances of Galactic cosmic rays (GCR) in the charge (Z) range $Z >10$ with excellent charge resolution, displaying well resolved individual element peaks for $10\leq Z \leq 40$. During its record-breaking 55-day flight, SuperTIGER collected $\sim 4.73 \times 10^6$ Iron nuclei, $\sim$8 times as many as detected by its predecessor, TIGER, with charge resolution at iron of < 0.18 cu. SuperTIGER measures charge (Z) and energy (E) using a combination of three scintillator and two Cherenkov detectors, and employs a scintillating fiber hodoscope for event trajectory determination. The data include more than 600 events in the charge range $30< Z \leq 40$. SuperTIGER is the first experiment to resolve elemental abundances in this charge range with single-element resolution and high statistics. The SuperTIGER measured abundances are generally consistent with previous experimental results from TIGER and ACE-CRIS, with improved statistical precision. Our results confirm the earlier results from TIGER, supporting a model of cosmic-ray origin in OB associations.

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