We irradiated an iron meteorite with high-energy protons (85% speed of light) to mimic the effects of cosmic rays on metal-rich materials. The measured gamma-ray emissions from the now-radioactive meteorite provide element-diagnostic signatures of the composition of the iron meteorite.

Our data benchmarked models used to determine the likelihood of such an event at asteroid (16) Psyche, and the potential science return of such a measurement.

Psyche Gamma-Ray and Neutron Spectrometer measurements of cosmic-ray activation products are a new technique for deriving surface composition from orbit.