

CRaTER Verification Procedure/Report

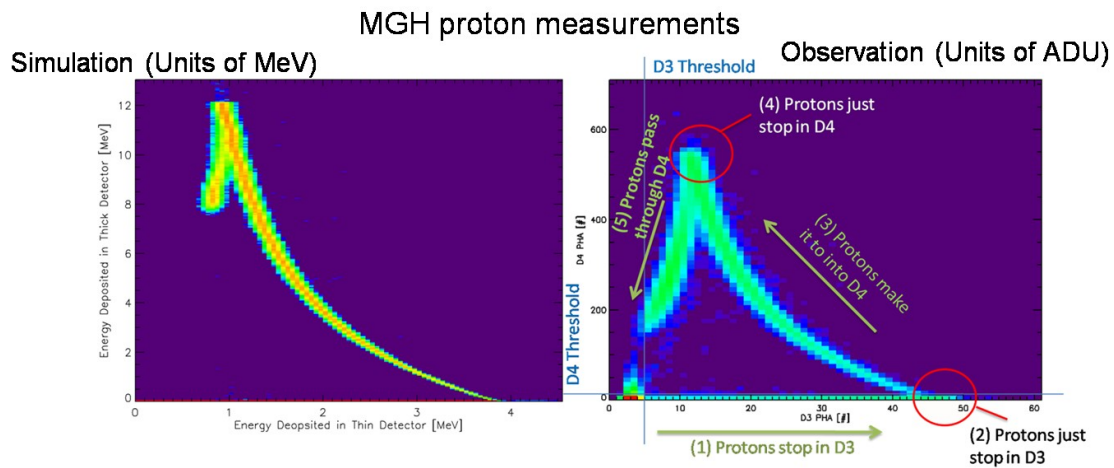
Title: (8.3.1) Linear Energy Transfer Spectrum Document 32-06020.21

Reference: 32-01205 Instrument Requirements Document Section 8.3.1

Requirement: The fundamental measurement of the CRaTER instrument shall be of the linear energy transfer (LET) of charged energetic particles, defined as the mean energy absorbed (ΔE) locally, per unit path length (Δl), when the particle traverses a silicon solid-state detector.

Procedure: One dimensional numerical simulations will be used to predict the energy deposition in the silicon detectors as a function of input and evolving LET spectra through the instrument. These simulations will demonstrate that the energy deposition in the silicon detectors is sufficient to measure the local LET spectrum and provide predictions for comparison with the beam and radiation tests.

Results: We used the GEANT radiation transport code to simulate the effect of proton LET in the CRaTER telescope. Simulations of the detailed relationship between LET observed in a pair of detectors compare favorably with observations of a proton beam at Massachusetts General Hospital collected with the Engineering Model and Flight Model S/N 2.



S/N: 01 & 02

Passed/Failed: Passed

Comments:

Performed by: JCKasper

R&QA: _____

Date: 1 November 2007

Date: _____