Looking at the Moon

Professor Allen Mincer and his Ph.D. student Grant Christopher are studying the Sun by looking at high energy cosmic rays coming from the direction of the Sun and Moon. They are performing a series of simulations to understand data obtained from the MILAGRO (Multiple Institution Los Alamos Gamma Ray Observatory) detector in the Jemez Mountains near Los Alamos, New Mexico. Professor Mincer writes:

"Cosmic rays coming from the direction of the sun or moon (but originating much further away) may hit the sun or moon and not make it to Earth. This can be detected here on Earth as a paucity of cosmic rays coming from these directions, effectively a solar or lunar cosmic-ray shadow. Particle air-showers from TeV (very high energy) cosmic rays have been measured using Milagro. Since we know the Earth's magnetic field, measuring the lunar shadow with Milagro tells us about the detector's angular resolution and allows calibrating the detector's energy scale. Measurement of the Solar shadow can be used to obtain information about the interplanetary solar magnetic field and therefore teach us about the Sun. Looking for a second Lunar shadow deflected by the Earth's field in the direction opposite the main shadow allows setting limits on the antiparticle content of cosmic rays."

Acknowledgements:

"I am sort of in a stunned state, watching these jobs running in a few hours when I used to have to wait about 3 months to get results." Prof. Allen I. Mincer
Simulated (right, radians) TeV cosmic-ray shadows of the moon.

PBS Script Generator
An interactive tool that generates PBS script based on user's input. Check this page for more details.

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