

The Haunting Of The Halloween Forbush Decrease of 2003

The Haunting of the Halloween Solar Flare Forbush Decrease of 2003

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In our experiment we ran the Moon detector from September 1st of 2003 to February 4th of 2004, recording data at one-hour intervals. The panels were placed parallel to the equator. We recorded approximately 60 million Muons.

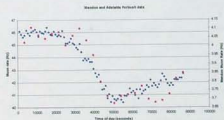
Forbush originally discovered the Forbush decrease in 1954. It is the decrease in the cosmic-ray intensity after a solar flare. Flares occur more often during the solar maximum phase of the sun's eleven-year cycle.

This solar flare occurred after approximately three years from the last solar maximum, thus it was unexpected. The solar flare that occurred on the 28th of October was one of the largest recorded and was classified as an X18 magnitude solar flare. Reaching us on the 29th proving to be one of the largest that hit the Earth directly. Due to the high velocity of the particles and the immense amount of energy, the solar flare reached Earth in about a third of the time that it would normally take to reach this planet.

As the solar flare spreads out, it affects the magnetic field of the whole solar system and in order for it to return back to normal, it takes about two weeks for the effects to dissipate. After the initial shock wave hit Earth, as the solar system magnetic field slowly stabilized, so did the Muon rate.

Both the facilities at Mondul and Adelaide experienced an approximately ten percent drop in the Muon rate. Both facilities showed the decrease in the data at the same time, since the shock wave passed over the Earth extremely quickly.

Halloween Solar Flare: Forbush Decrease



Pressure-Corrected Muon Rate

