SOLAR PARTICLE HISTORY: 1983 VERSION.

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It has long been known that the great majority of nuclear-active solar particles are emitted in a few large storms in each 11-year cycle. A single storm (or group of storms) in August 1972 dominated the fluence of particles of energy >10 MeV. Such storms can occur, it seems, at any time within the more active half of the cycle.

On a time scale long compared to 11 years, our knowledge comes from two sources. Terrestrial ^{14}C sets limits on the largest proton bursts that can have taken place in the last 8000 years. Lunar surface samples have yielded data on mean fluxes on a time scale from the ^{14}C to the ^{53}Mn mean life. Our group has found a mean flux of 70 protons >10 MeV and a rigidity constant R_o = 100 MV to be robust on the 10^6-10^7 year time scale [Kohl, et al., 1978]. Over the shorter periods represented by ^{14}C and ^{81}Kr the fluxes seem to have been higher [Boeckl, 1972; Yaniv, et al., 1980], by a factor of roughly three. This is discussed in detail by Reedy, Arnold, and Lal [1983a, b].

The advent of accelerator mass spectrometry creates new opportunities in this field of study as elsewhere. The higher sensitivity of the method permitting drastic reduction of sample size, is obvious to all. The improved precision already demonstrated [Nishiizumi, et al., 1983], with further gains to be expected, may prove equally significant. Some examples will be discussed.

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