

THE QUIET TIME FLUX OF
0.16 - 1.6 MeV COSMIC RAY POSITRONS

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Measurements of the cosmic ray positron flux near ~ 1 MeV are of interest because of possible contributions in this energy region from β -decay sources. Previously we reported (Hurford *et al.*, 1973) an upper limit for the quiet time positron flux at ~ 1 MeV of $\sim 2 \times 10^{-3} \text{ cm}^{-2} \cdot \text{sec}^{-1} \cdot \text{sr}^{-1} \cdot \text{MeV}^{-1}$, based on a preliminary analysis of data from the Caltech Electron/Isotope Spectrometer on IMP-7. The method of positron detection is discussed in Mewaldt *et al.* (1975). Our IMP-8 instrument has somewhat improved positron detection efficiency and includes an analysis mode that allows a determination of the rate of background events with positron-like signatures. Subtraction of this background contribution and the accumulation of additional data with improved statistical accuracy from both instruments shows that less than 30% of the positron-like events are due to positrons. This results in the new upper limits to the 0.16 to 1.6 MeV positron flux shown in Figure 1. These new upper limits are a factor of ~ 2 lower than those we reported previously. Thus we find no evidence for ~ 1 MeV positrons which might result from the β -decay of radioactive interstellar secondaries or the decay of ^{56}Co in supernovae.

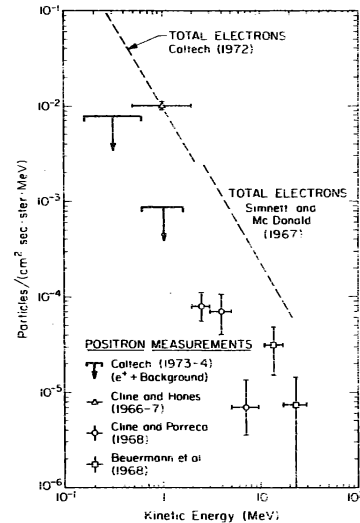


Fig. 1. Low energy positron measurements. The new upper limits reported here are compared to earlier measurements for which references can be found in Hurford *et al.* (1973).

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References.

- Hurford, G. J., R. A. Mewaldt, E. C. Stone, R. E. Vogt, 13th Int. Cosmic Ray Conf., Conf. Papers, Denver, 1, 330, 1973.
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