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Effects of Supernovae Cosmic Rays on the Earth's Atmosphere¹

ALEXANDER YELLAND, Washburn University — Geochemical evidence has established that at least one, if not more, supernova explosions occurred within 50-100 pc of Earth about 2.5 million years ago. Recent work estimated the cosmic ray flux arriving at Earth for supernovae at 100 pc and 50 pc under different assumptions about particle transport. Here, we report on the re-examination of some of those results using an updated computation of the flux of protons under an empty-space diffusive transport approximation. We find that some cases reported in past work are an overestimate of the flux. This has implications for modeling the atmospheric chemistry changes. Our current work includes updating those simulations and extending calculations to closer supernova distances.

¹Washburn University Physics Astronomy Department

Alexander Yelland Washburn University

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