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Climatic and Biotic Effects of a Gamma Ray Burst near Earth

DANIEL HOGAN¹, BRIAN THOMAS, ADRIAN MELOTT, University of Kansas
— A gamma ray burst (GRB) within the Milky Way has been recently proposed as a novel mechanism for triggering a mass extinction on earth. Thomas et al have modified the two-dimensional Goddard Spaceflight Center Atmospheric Model to simulate the effects of a 100kJ/m^2 GRB-induced influx of energy to Earth. The model's output, atmospheric composition as a function of time and latitude, was further analyzed to elicit possible effects on the biosphere. Using a biological weighting function for UV-induced DNA damage, it was found that in such a scenario peak DNA damage exceeded 16 times its normal global average value as a consequence of atmospheric disruption. Decreases in estimated photosynthesis levels and energy flux at the surface were also identified.

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Daniel Hogan
University of Kansas

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