Abstract Submitted
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Terrestrial Effects of Astrophysical Ionizing Photon Events: Spectrum and Variability[1] ADRIAN MELOTT, University of Kansas, LARISSA EJZAK, University of Wisconsin, BRIAN THOMAS, Washburn University, MIKHAIL MEDVEDEV, University of Kansas — A variety of astrophysical ionizing photon sources such as gamma-ray bursts, supernovae, magnetars, and solar flares represent a hazard to the Earth's biosphere, primarily through breaking the strong triple bond in the N_2 molecule in the atmosphere. This produces oxides of nitrogen which catalyze depletion of the O_3 shield. As a result, greatly increased levels of solar UVB reach the surface. UVB is absorbed by and damages the DNA molecule, and is known to be lethal for organisms such as phytoplankton which lie at the base of the food chain. Such astrophysical sources vary greatly in their time dependence and spectrum of photon energies. We have computationally explored the parameter space of such variation, and describe the consequences for the biosphere.

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