



Ozone Depletion from Nearby Supernovae (Paperback)

By Neil Gehrels

Bibliogov, United States, 2013. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****. Estimates made in the 1970 s indicated that a supernova occurring within tens of parsecs of Earth could have significant effects on the ozone layer. Since that time improved tools for detailed modeling of atmospheric chemistry have been developed to calculate ozone depletion, and advances have been made also in theoretical modeling of supernovae and of the resultant gamma ray spectra. In addition, one now has better knowledge of the occurrence rate of supernovae in the galaxy, and of the spatial distribution of progenitors to core-collapse supernovae. We report here the results of two-dimensional atmospheric model calculations that take as input the spectral energy distribution of a supernova, adopting various distances from Earth and various latitude impact angles. In separate simulations we calculate the ozone depletion due to both gamma rays and cosmic rays. We find that for the combined ozone depletion from these effects roughly to double the biologically active UV flux received at the surface of the Earth, the supernova must occur at approximately or less than 8 parsecs.



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