

Analyzed Report 5

The effects of SPE-produced HO(x) species on the odd nitrogen abundance of the middle atmosphere as well as the SPE-produced long term effects on ozone. The production of HO(x) and NO(x) and their subsequent effects on ozone can also be computed using energy deposition and photochemical models. Model computations indicate fairly good agreement with ozone data for the SPE-induced ozone depletion caused by NO(y) species connected with the August 1972 SPE. Solar particle events (SPEs) have been investigated since the late 1960's for possible effects on the middle atmosphere. Solar protons from SPEs produce ionizations, dissociations, dissociative ionizations, and excitations in the middle atmosphere. The changes are mainly at high latitudes and are on time scales of several months, after which the NO(y) drifts back to its ambient levels. The model computations indicate that NO(y) will not be substantially changed over a solar cycle by SPEs.

