

POLAR THERMOSPHERIC HEATING UNDER PROTON PRECIPITATION

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The precipitating protons play an important role in the heat budget of polar thermosphere during solar proton events. In this paper the proton heating efficiency is studied using all possible sources of heating and cooling of polar thermosphere. A special attention is paid on the reaction $N_2(A^3 \text{ EMBED Equation.3}) + O$ which is considered as one of the most significant source of proton heating in auroral region. The new findings of temperature dependence of the reaction rate coefficient of the reaction $N_2(A^3 \text{ EMBED Equation.3}) + O$ are also incorporated in the model. The proton heating efficiency is found as high as 71 percent in the peak energy deposition region (110-130 Km) and it strongly depends on altitude. These results would be very useful in the study of heat budget of polar thermosphere during solar proton events.

Aurora , proton , heating

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