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STRATOSPHERIC SUDDEN COOLING AFTER SOLAR PROTON EVENT OVER SYOWA STATION, ANTARCTICA (ABSTRACT)

Masahiro KODAMA[1], Tsuyoshi KOHNO[1] and Hiroshi KANZAWA[2]

[1]*Institute of Physical and Chemical Research, 2–1, Hirosawa, Wako 351–01*
[2]*National Institute of Polar Research, 9–10, Kaga 1-chome, Itabashi-ku, Tokyo 173*

Forty-three solar proton events (SPEs) with energies greater than 30 MeV, whose time integrated proton flux throughout an event is above 10^7 /cm^2, are selected from four solar cycles of 1956 to 1990, and their influences on the lower stratospheric temperature have been investigated by using radiosonde data from Syowa Station, Antarctica. It is shown that 64 % of the 13 SPEs for which radiosonde data were available are followed by sudden cooling of −2.4°C on average at 20–30 km altitude. Also 69 % of the 13 SPEs which recorded proton flux above 10^8 /cm^2 give a mean value of −3.5°C. Fifteen events accompanied by GLE (Ground Level Enhancement, on the order of GeV protons) exhibit significant cooling except for two. Interpretation of this sudden cooling in the lower stratosphere is discussed.

For details, the reader may refer to the full paper of this work (M. KODAMA *et al.*: J. Geomagn. Geoelectr., **44**, 361, 1992).

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