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Effects on mesospheric temperatures from Solar Proton Events

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Nighttime observations of the hydroxyl (OH) Meinel (3,1) band rotational temperature have been made over Stockholm, Sweden, since 1991. A superposed epoch analysis has been performed on to determine the average seasonal behaviour of mesospheric temperature. This large seasonal variation was removed from the data set, and a second super-posed epoch analysis was then performed on these de-trended data centred on well-isolated Solar Proton Events (SPE). When taken as a whole, the effects of SPE on mesospheric temperature are not apparent. However, when examined as a function of proton flux unit (PFU), it is clear that the effects occur only for those events in excess of 4000 PFU. In addition, the effects are delayed with respect to SPE onset by 2-3 days, raising the possibility that the effects are due to the associated geomagnetic activity and not the SPE itself. The analysis techniques as well as the results and implications will be presented and discussed.