



Sub-auroral characteristics of super-substorms as observed from Indian Antarctic station Maitri

ShipraSinha⁽¹⁾, SnehaGokani⁽²⁾, Rahul Rawat⁽¹⁾, Ashwini K Sinha⁽¹⁾ and GeetaVichare⁽¹⁾

(1) Indian Institute of Geomagnetism, Navi Mumbai, India, e-mail: sinha.shipra62@gmail.com; rrawat@iigs.iigm.res.in; sinha.ashwini@gmail.com; geeta@iigs.iigm.res.in

(2) Tongji University, Shanghai, China; e-mail: gokanisneha@gmail.com

Super-substorms (SSS) are long duration events with $SML < -2500$ nT, which are not so frequently observed. Characteristics of such sub-storms have not been studied in details so far. The case study of two shock induced substorms which occurred on 2005 January 21 and 2010 April 5 had been studied earlier by Hajra and Tsurutani (2018)¹, wherein it was observed that auroras associated with these events did not have the typical midnight onset characteristic. At the time of the SML peak, intense auroras were observed during pre-midnight and post-midnight local time sector instead of midnight. Thus, it becomes important to have a case-to-case study for the better understanding of such substorms phenomena and examine their general statistical behaviour. In the present study, an attempt has been made to study the sub-auroral characteristics of these events using multi-technique observations at Indian Antarctic station Maitri (geographic 70.75° S, 11.75° E) and other relevant corroborating satellite observations as well as ground observations from both the hemispheres. Low latitude characteristics of SSS will also be examined from the available ground stations relevant to those observed events. Depending upon the availability of data, we will also try to decipher the longitudinal and latitudinal extent of electrojet currents for these events.

¹RajkumarHajra and Bruce T. Tsurutani, "Interplanetary Shocks Inducing Magnetospheric Super-substorms ($SML < -2500$ nT): Unusual Auroral Morphologies and Energy Flow" *The Astrophysical Journal*, 858:123 (6pp), 2018 May 10