



Different Sun-Earth energy coupling between different solar cycles

Masatoshi Yamauchi

Swedish Institute of Space Physics (IRF), Kiruna, Sweden (m.yamauchi@irf.se)

Geoeffect of the extremely low solar (sunspot) activity starting from the last solar minimum is one of major space science issues. This study compared responses of global geomagnetic indices Dst, Kp, and AL to the same solar wind conditions (density, velocity, magnetic field and their products) between the recent decade (2005-2014) and each of the previous four decades (1965-1974, 1975-1984, 1985-1994, 1995-2004) using the NASA OMNI hourly values up to August 2014. It is found that geomagnetic activity for a given solar wind condition, namely the Sun-Earth coupling efficiency, during the last 10 years (from after the declining phase of cycle #23 to the maximum of cycle #24) is quantitatively lower than those during the previous four decades (each decade approximately corresponds to cycles #20–23, respectively). The low Sun-Earth coupling efficiency became obvious from around 2006 and continued until now with a sharp peak at 2009. The speciality after 2006 is more obvious in Dst than in AL.

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