

M02a A Geo-coronal Solar Wind Charge Exchange Event Associated with the 2006-Dec-13 CME-driven Shock Detected by Suzaku Satellite

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We report a case study of the solar wind charge exchange (SWCX) process in the frame of one well-studied coronal mass ejection (CME) event occurred on 2006 December 13th, which involves the largest CME-driven shock ever detected in the space era with a fleet of spacecrafts. *Suzaku* satellite captured the CME triggered SWCX emission in the X-ray range from 0.3 to 10 keV. Prominent non-thermal emission lines are detected at energies of O VIII, Ne X, Mg XI, Mg XII, Si XIII and Si XIV, and the observed N VI  $1s^15p^1$  to  $1s^2$  transition at 532 eV provides a strong evidence for the charge exchange origin. Previously, several SWCX records have mentioned a time coincidence with a flare in proton flux, which was also suggested as a prediction tool to remove the transient contamination from the soft diffuse X-ray background study. However, the arrival timing of the SWCX reported in this work corresponds to the passage of an ICME-originated magnetic cloud instead and we learned that proton flux enhancement is not always an efficient indicator for the SWCX event. Furthermore, a scenario of magnetic reconnection between the magnetic cloud and the Earth magnetosphere may revise the geometry of the SWCX procedure and cross section modelling.