

# Magnetotail responses to sudden and quasi-periodic solar wind variations

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A clear bipolar (negative/positive) signature in the  $E_y$  component was observed by the Cluster satellite in the magnetotail during a sudden impulse (si) on October 11, 2001 (day 284). During the interval of the negative perturbation in  $E_y$ , the magnetic field strength in  $B_x$ , a dominant magnetic field component, was nearly constant. However, the amplitude of  $B_x$  was strongly enhanced during the positive  $E_y$  perturbation. We suggest that the observed E and B field variations are due to outward/inward plasma motions, associated with expanded and then compressed magnetopause variations. We also observed quasi-periodic geomagnetic perturbations in the Pc5 band ( $\sim 1-6$  mHz) at the low-latitude ground station Kakioka ( $L = 1.25$ ) following the si event. They were highly correlated with the magnetic field perturbations at Cluster in the magnetotail ( $X_{gse} = \sim 12$  Re). We show that the source of these perturbations is the quasi-periodic solar wind pressure variations moving tailward.