

GEOTAIL observations of spiky electric field at quasi-perpendicular shock

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The electron dynamics at the collisionless shock is an important subject to the electron acceleration process. However, detailed physics in the electron-scale has still not been understood. It is known that existence of spiky fluctuation of electric field is observed at the foot and the overshoot region of the quasi-perpendicular shock. The strong gradient of the electric field significantly impacts upon the electron dynamics at the shock front. Recently, we found large amplitude spiky electric field up to 40 mV/m in the shock transition layer of a Cluster-II shock crossing event. The observed feature can be well-interpreted by recent kinetic simulation results. To investigate the relation between such large amplitude electric fluctuation and electron acceleration at the bow shock, we carried out a statistical survey of the electric field fluctuation at quasi-perpendicular bow shocks based on the large collection of GEOTAIL shock crossings. We will show preliminary results of the statistical analysis and discuss effects of the spiky electric fluctuation on the electron acceleration at the quasi-perpendicular bow shock.