

Abstract Submitted
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Plasma heating across quasi-perpendicular shocks observed by the MMS mission¹ LI-JEN CHEN, Goddard Space Flight Center; University of Maryland at College Park, MAGNETOSPHERIC MULTISCALE (MMS) TEAM — Collisionless shocks are one of the most fundamental nonlinear phenomena that involve intense plasma heating and acceleration in space and astrophysical systems. Despite decades of efforts, the key physics underlying electron and ion heating remains unsolved. The continuous 3D high accuracy high cadence data from the Magnetospheric Multiscale (MMS) mission have revealed a drastically different picture on electron and ion heating in our preliminary examination of a number of bow shock crossings. In particular, the MMS measurements of 3D plasma distribution functions that are orders of magnitude higher cadence than ever indicate an intimate relation between the key thermalization phase of ions, the anisotropic temperature increase of electrons, and intense wave fluctuations. Open questions will be posted for computational studies and laboratory experiments on collisionless shocks.

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