

EGU22-3219

<https://doi.org/10.5194/egusphere-egu22-3219>

EGU General Assembly 2022

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## Ion Acceleration at the Quasi-Parallel Shock: The Source Distributions of the Diffuse Ions

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The terrestrial bow shock is the boundary between the supersonic solar wind and the terrestrial magnetosphere and converts the kinetic energy of the solar wind into thermal energy, allowing the flow to become subsonic and move past the magnetosphere. Shocks are an important acceleration site for ions and electrons in collisionless plasmas and responsible for much of the particle acceleration in solar, planetary, and astrophysical regions. One of the fundamental outstanding questions of ion acceleration at the quasi-parallel bow shock is which portion of the incoming solar wind ion distribution ultimately becomes the seed population that is subsequently accelerated to high energies.

This talk focuses on distribution functions of protons and alpha particles observed by the HPCA and FPI instruments onboard the MMS satellites during an MMS crossing of the quasi-parallel bow shock. The bow shock transition from the downstream region into the upstream solar wind shows the presence of specularly reflected ions and a distribution at 90 degree pitch angle ions in the shock ramp consistent with shock drift accelerated ions.