

EGU22-9885

<https://doi.org/10.5194/egusphere-egu22-9885>

EGU General Assembly 2022

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MMS bow shock crossings database

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Identifying collisionless shock crossings in data sent from spacecraft has so far been done manually. It is a tedious job that shock physicists have to go through if they want to conduct case studies or perform statistical studies. We use a machine learning approach to automatically identify shock crossings from the Magnetospheric Multiscale (MMS) spacecraft. We compile a database of those crossings including various spacecraft related and shock related parameters for each event. Furthermore, we show that the shocks in the database have properties that are spread out both in real space and parameter space. We also present a possible science application of the database by looking for correlations between ion acceleration efficiency at shocks and different shock parameters such as the shock geometry and the Mach number.