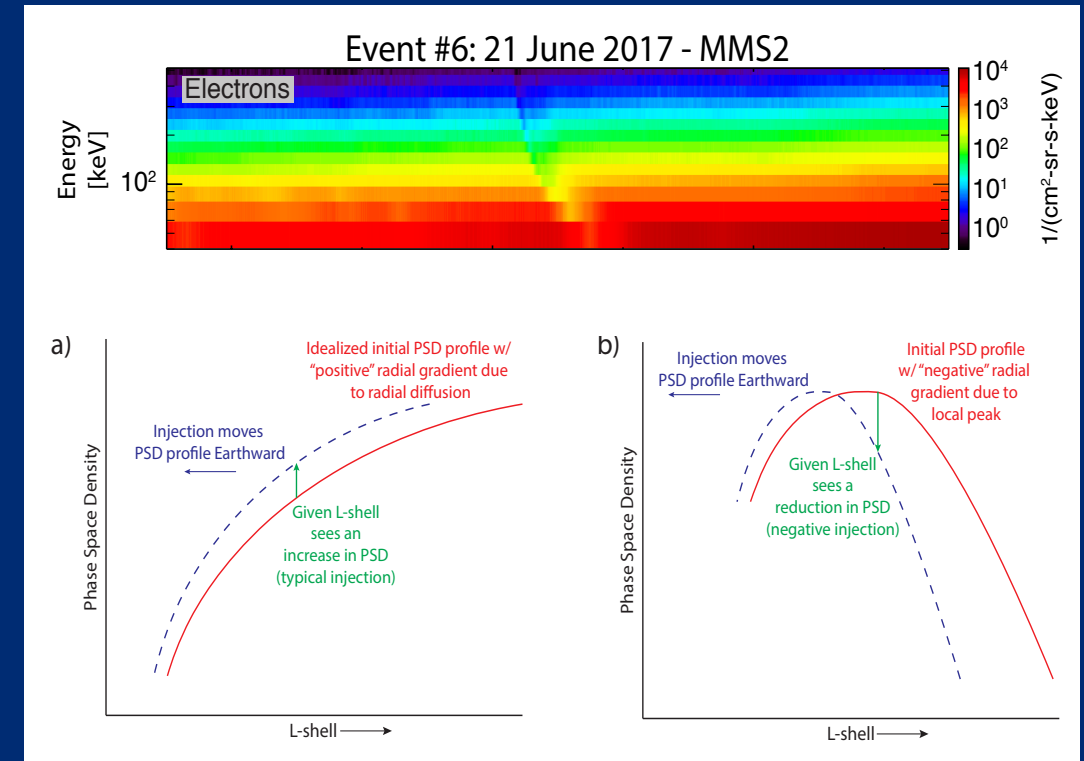


What are “negative injections” in the Earth’s magnetosphere?

- Energetic particle injections are the sudden earthward transport and/or acceleration of 10s to 100s keV particles – these are typically observed by spacecraft as time-dispersed sudden increases in particle flux
- “Negative injections” are a new signature in the Earth’s magnetosphere that exhibits the opposite behavior (less particles instead of more) to what we expect for typical “energetic particle injections”
- NASA’s Magnetospheric Multiscale (MMS) mission provides a novel opportunity to test multiple hypotheses for how negative injections are generated
- Our research provides evidence that negative injections are caused by the same physical process as typical injections, but are manifestations of different magnetospheric conditions



These unique “negative injection” signatures are the result of the same phenomenon as the typical energetic particle injections that we’ve been studying for decades, but under different conditions.