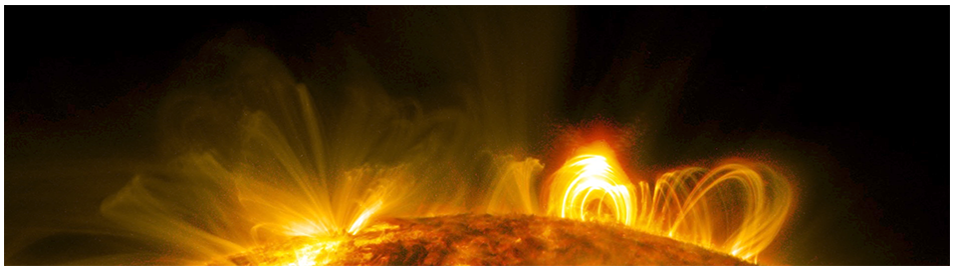

Contribution ID: **55** Type: **Poster**

Pitch-angle distribution of accelerated electrons in 3D current sheets with magnetic islands

Thursday 18 November 2021 09:45 (1 hour)

We present diagnostic tools for particle energy and pitch angle distributions at acceleration in 3D Harris-type reconnecting current sheets with a single or multiple X-nullpoints taking into account the ambient plasma feedback to the presence of accelerated particles. We explore accel- eration of particles during their passage through 3D reconnecting current sheets occurring in the interplanetary space using particle-in-cell (PIC) approach with single and multiple X-nullpoints (magnetic islands). We consider coalescent and squashed magnetic islands formed in the current sheets with different thicknesses, ambient density and mass ratios, and simulate energy, density and pitch-angle distributions of accelerated particles. We report distinct populations of two groups of particles: transit and bounced ones, which have very different energy and asymmetric pitch-angle distributions associated with the magnetic ffield parameters. The simulated pitch angle distributions of accelerated particles are presented for different angles of the spacecraft paths through reconnecting current sheets. The outcomes are compared with some in-situ observations of solar wind particles from Ace, Wind and Parker Probe. This comparison indicates that locally generated superthermal electrons can account for the counter-streaming 'strahls'often observed in the pitch-angle distribution spectrograms of the satellites crossing local current sheets.

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