RSPP seminars

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"The Source and Evolution of Suprathermal Electrons in the Solar Wind and Heliosphere"

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Electrons in the Solar Wind are typically described using three populations: A thermal, isotropic, core; a suprathermal isotropic halo and a suprathermal strahl that flows outward through the heliosphere aligned to the interplanetary magnetic field. Suprathermal electrons are important because despite making up only a small fraction of the solar wind by density, they carry the majority its heat flux, and the strahl in particular can be used as a sensor of the topology of the heliospheric magnetic field and thus the balance between open and closed heliospheric magnetic flux.

The formation of the suprathermal electron populations in the solar wind is not fully understood, evidence suggests that the halo is formed through the scattering of the strahl in pitch angle as it propagates through the heliosphere. By studying the characteristics of the strahl at different points in the heliosphere it is possible to constrain the scattering mechanism and therefore the formation mechanism of the halo. Here we present observations of Solar Wind electrons taken by the Cassini Spacecraft en route to Saturn, that are consistent with the scattering of the strahl by whistler mode waves. We also discuss a preliminary analysis of the difference between core and halo electrons using high energy resolution Cluster data.

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Wednesday, May 3rd at 2 pm in Physics LTD