



Contribution ID: 35

Type: Oral Presentation

## Modelling of the injection function of solar energetic particles (SEPs).

Friday, 29 June 2018 12:00 (20 minutes)

Solar energetic particles are accelerated at the Sun during either short-lived, impulsive events called solar flares or gradual events called coronal mass ejections (CMEs). An injection function is used to model the injection of SEPs from a source region on the Sun. Previously, injection functions were modeled by using arbitrary functions, but it has become increasingly important to base the injection function on more realistic parameters and constrain it with available spacecraft data. This study investigates the particle intensities from transient events by varying parameters of the injection function used in our model. The importance of the onset, decay-times and longitudinal extent are discussed while comparisons are drawn between single and multiple Gaussian injections from the same active region. Data from spacecraft is also used to constrain some of these parameters. In the near future, the Parker Solar Probe and Solar Orbiter missions will provide us with new data to improve the injection function even further. The future of this study includes using a multi-wavelength approach from a multi-messenger perspective to quantify the injection function of SEPs to form the first steps toward a predictive space weather model.

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**Session Classification:** Space Science

**Track Classification:** Track D2 - Space Science