

Time-series SEP simulations and complications

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1. Motivation



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Why splitting particle events like this one?





Variation of intensities with the heliocentric radial distance, R

a) Most of the SEP event data is measured at 1 AU

b) Space Agencies send missions to the inner heliosphere

c) Current radiation standard environment models may overestimate the SEP fluence by assuming an R⁻² dependence

 d) The contribution of interplanetary shocks in accelerating particles while travelling into the heliosphere needs to be taken into account







Gradual events modelling -

Individual SEP events

The statistical model tool for interplanetary missions (Away-from-1AU modelling) of the **ESA SEPEM** Project (Crosby et al. 2015) uses outputs from the **SOLar Particle ENgineering COde 2 (SOLPENCO2)** tool.



A series of events





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Fluence radial dependence







Challenge – Time series radial dependence, simple case

From Lario et al. (2007)



Difficulties - Time series Virtual Events



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Difficulties - Time series Virtual Events



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Thanks for your attention!