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Constraints on the Longitudinal Transport of SEPs from Correlated Observations of 3He-rich Events at ACE and STEREO-A

Solar energetic particle (SEP) events in which the isotopic abundance ratio 3He/4He greatly exceeds the value ˜4x10-4 commonly found in solar wind plasma normally originate from particle acceleration associated with magnetic reconnection in solar flares. Compact source regions should cause these 3He-rich SEP events observed in the heliosphere to have relatively narrow distributions in heliographic longitude. For nearly a complete solar cycle, both the ACE and STEREO-A (STA) spacecraft have been observing 3He-rich events at ˜1 au from the Sun and various longitudinal separations. Using data from the SIS and ULEIS instruments on ACE and the LET instrument on STA, we are investigating the correlations between the detections of 3He-rich SEPs with energies near 1 MeV/nucleon at the two spacecraft to obtain constraints on the longitudinal transport of SEPs in the heliosphere inside ˜1 au. These in-situ SEP observations, combined with remote-sensing observations of the source regions, will be used to address questions of interplanetary transport of SEPs.

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