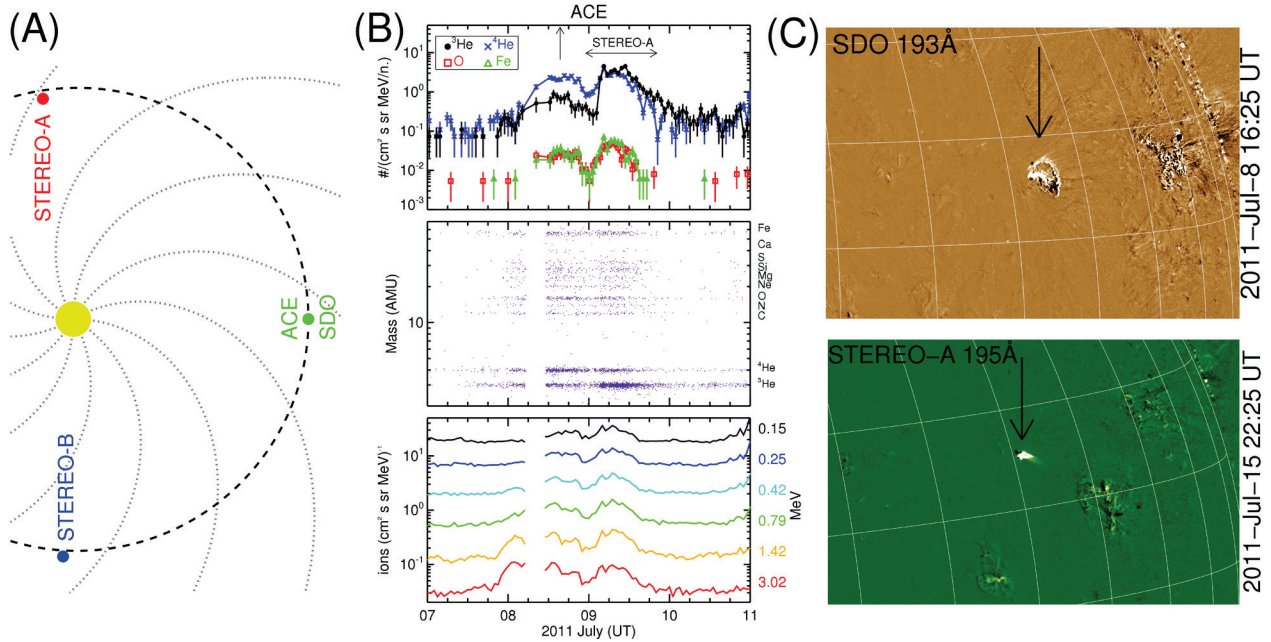


## ACE News #169 - May 29, 2014

### Long-Lasting $^3\text{He}$ -Rich Solar Energetic Particle Sources



(A) Positions of STEREO-A and -B in the ecliptic plane in July 2011. (B) (upper panel): 1-hr ACE/ULEIS 0.23-0.32 MeV/nucleon  $^3\text{He}$ ,  $^4\text{He}$ , O, and Fe intensities. The arrow indicates an extreme ultraviolet (EUV) jet in newly emerging AR 11246. Double-ended arrow denotes the STEREO-A  $^3\text{He}$ -rich period shifted in corotation time. (middle panel): 0.4-10 MeV/nucleon ULEIS mass spectrogram. (lower panel): 1-hr ACE/EPAM ion intensities from LEMS120. (C) 5-minute difference EUV SDO/AIA (upper) and SECCHI/STEREO-A (lower) images. The arrows point to the jet in AR 11246.

Since February 2011 STEREO-A and -B, along with near-Earth spacecraft (s/c), have provided for the first time a view of the full solar surface. This allows continual tracking of solar active regions (ARs) for their entire lifetime. With the advantage of a wide angular separation between the two STEREOs and the near-Earth ACE s/c, we report first time observations of multiple  $^3\text{He}$ -rich solar energetic particle (SEP) injections from the same AR for a relatively long time period lasting at least a quarter of a solar rotation. We identified two long-lasting  $^3\text{He}$ -rich SEP sources, one relatively large AR 11244, accompanied by B-class X-ray flares and another small, newly emerging AR 11246 near the border of a low-latitude coronal hole that produced numerous jet-like emissions.  $^3\text{He}$ -rich SEPs associated with AR 11244 were consecutively observed by STEREO-B on July 1 and ACE on July 8 and with AR 11246 by ACE on July 9 and STEREO-A on July 16. Previous single s/c observations showed such energetic ion bursts over relatively short time intervals (< one day) presumably due to loss of magnetic connection to the flare site. These new observations reveal that conditions for particle acceleration in a single solar region may pertain for a long time, implying that the processes are more continuous than previously thought. For further details see Bučik *et al.* *Astrophysical Journal*, Vol. 786, 71, 2014.

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