STEREO observations of suprathermal ion composition in CIRs around small SEP events

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- Observations of corotating enhancements suggest that these events are not accelerated out of a background low energy SEP source population (Richardson et al., 1993)

- At high heliolatitudes - SEP-like elemental composition in CIR prior to reverse shock - related to ICME transit (Simnett et al., 1995)

- On occasion, CIR possibly re-accelerate 'remnants' from earlier SEP (Richardson, 2004)

- So, relative contribution from SEP source population is poorly understood

(Chotoo et al, 2000)
January 2007 events

W62  W64  E79
CIR2 reverse shock?
May 2007 two SEP events
He/H ratio
Fe/O ratio

STEREO-A

Date 2007 May

SIT-A, 0.10 MeV/n

May 24, 2007

counts per bin

mass (amu)
Corotating time delay

SIT/STEREO H ions / (cm² s sr MeV)

Date 2007 May

17 19 21 23 25 27

7h-delay 2h-delay

CIR1 CIR2
Energy spectra
Conclusion

- Fe enrichment in January 2007 events was connected with weak impulsive SEP event on 24 January; however, following CIR shows Fe abundance consistent with CIR event averaged Fe abundance suggesting no remnants from preceding event were contributing to the CIR.

- Fe – enrichment in May 2007 was related with ICME passage as well as with SEP event on 23 May; no Fe ions were measured during the SEP event on 19 May.

- Fe - enrichment inside CIR (behind stream interface) on May 24 might have been influenced by ICME injection as suggested by difference in energy spectra from preceding SEP event.
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