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Use of Incident and Reflected Solar Particle Beams to Trace the Topology of Magnetic Clouds

Olga Malandraki (1), Lun C. Tan (2), Donald V. Reames (3), and Linghua Wang (4)

(1) Institute of Astronomy and Astrophysics, National Observatory of Athens, P.O. BOX 20048, Lofos Nymfon, Thiseio, 11810, Athens, Greece (omaland@astro.noa.gr/0030-2103490106), (2) Department of Astronomy, University of Maryland, College Park, MD 20742, USA (lunctan@gmail.com), (3) Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, USA, (4) Space Science Laboratory, University of California, Berkeley, California, CA94720, USA

Previously, non-relativistic electron beams were used as a probe to detect the topology of magnetic clouds (MCs) (e.g., Larson et al. 1997; Malandraki et al., 2002). However, in these earlier studies only the onset time analysis of the incident particle beam is used to determine the length of one leg of a MC. Since we have confirmed (Tan et al. 2009) the possible presence of reflecting boundaries in large solar energetic particle events, we are able to use both incident and reflected particle beams to measure the length of the two legs of a MC, and answer the query if both legs are connected to the Sun. We will present our analysis results of the 2002 April 21 MC event by using the Wind/LEMT ion and Wind/3DP electron data. Implications for space weather will also be discussed.

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References

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