

THE CME-FLARE RELATION REVISITED WITH STEREO OBSERVATIONS

NARIAKI V. NITTA¹, Markus J. Aschwanden¹, James R. Lemen¹, Jean-Pierre Wuelser¹ and Dominic M. Zarro²

1. Lockheed Martin Solar and Astrophysics Laboratory

2. ADNET Systems, Inc.

We study the association of solar flares since March 2007 with coronal mass ejections (CMEs), using images taken by the EUV Imager (EUVI), COR1 and COR2 coronagraphs on board STEREO. This is done by searching EUVI data for low coronal signatures attributable to CMEs, such as dimming, EUV waves and eruptions, following them to COR1 and COR2 fields of view. Base and running difference images (after correcting for differential rotation) as well as raw images in all the four filters of EUVI on STEREO A and STEREO B are viewed as movies to find the CME-related signatures. The COR1 data are particularly helpful for connecting the EUVI signatures with CMEs observed by COR2. Only 2 (out of 11) M-class flares and 7 (out of 64) C-class flares are convincingly associated with CMEs traceable beyond 5 Rs. There are also a handful of less intense (B-class and A-class) flares associated with CMEs. We discuss the "calibration" of the low coronal signatures with actual CMEs, quantitatively re-defining them to be used as reliable proxies for CMEs. Radio observations are also found to be of use to distinguish flares associated and not associated with CMEs. Lastly we consider the CME association of flares in terms of the following items about the flaring active regions: their basic properties, their relations with more global field, and local (spatial or temporal) changes therein. This study may help us understand the effect of (reconnection-driven) flare processes on the initiation and subsequent dynamics of CMEs.

Flare, CME, corona

Nariaki V. Nitta, Lockheed Martin Solar and Astrophysics Laboratory, B/252, Dept/ADBS, 3251 Hanover Street, Palo Alto, CA 94304, USA, nitta@lmsal.com, TEL: 1-650-354-5458