Reconnection in a slow Coronal Mass Ejection

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Abstract. This paper aims at studying reconnection occur- ring in the aftermath of the 28 May 2004, CME, first im- aged by the LASCO (Large Angle and Spectrometric Coro- nagraph) C2 at 11:06 UT. The CME was observed in White Light and UV radiation: images acquired by the LASCO C2 and C3 coronagraphs and spectra acquired by UVCS (Ultra- violet Coronagraph Spectrometer) allowed us to identify the level at which field lines, stretched outwards by the CME ejection, reconnect below the CME bubble. As the CME propagates outwards, reconnection occurs at increasingly higher levels. The process goes on at a low pace for sev- eral hours: here we give the profile of the reconnection rate vs. heliocentric distance over a time interval of ≈14 h after the CME onset, extending estimates of the reconnection rate to larger distances than previously inferred by other authors. The reconnection rate appears to decrease with time/altitude. We also calculate upper and lower limits to the density in the diffusion region between 4 and 7 $R_\odot$ and conclude by com- paring estimates of the classical and anomalous resistivity in the diffusion region with the value inferred from the data. The latter turns out to be ≥5 order of magnitudes larger than predicted by classical or anomalous theories, pointing to the need of identifying the process responsible for the observed value.

Keywords. Solar physics, astrophysics, and astronomy (Flares and mass ejections) – Space plasma physics (Mag- netic reconnection)

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