

Multi-scale reconnections in a complex CME

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A series of flares (GOES class M, M and C) and a CME were observed on 20-JAN-2004 occurring in close succession in NOAA 10540. Types II, III and an N radio bursts were associated. We use the combined observations from TRACE, EIT, H-alpha images from Kwasan Observatory, MDI magnetograms, GOES and radio observations from Culgoora and Wind/WAVES to understand the complex development of this event. We link the first two impulsive flares to tether-cutting reconnections and the launch of the CME, while the last of the flares, an LDE, to the relaxation phase following forced reconnections between the erupting flux rope and neighbouring magnetic field lines. We show that reconnection with the magnetic structure of a previous CME, launched about 8 hours earlier, injects electrons into open field lines having a local dip and apex of about 6 solar radii height. The dipped shape of these field lines was due to large-scale magnetic reconnection between expanding magnetic loops and open field lines of a neighbouring streamer. This particular situation explains the observed decametric N burst, and why N-bursts are so rare.