STUDY OF THE KINEMATICS, DRIVER OF THE
GLOBAL MORETON WAVE OBSERVED
ON 28-10-2003

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Abstract

We analyze evolution and kinematics of the fast, globally propagating Moreton wave of 2003 October 28 associated with the extreme X17.2 solar flare/CME event. This Moreton wave is distinct due to its azimuthal span of \(\sim 360\) deg. Thus its characteristics are studied in different propagation directions, and compared with the associated phenomena: EIT wave, coronal dimmings, radio type II burst, fast halo CME, and flare. The sectoral analysis give mean velocity values in the range of \(v \sim 900 - 1000\) km s\(^{-1}\); two sectors show wave deceleration. Analyzing the perturbation profiles indicates an amplitude growth followed by amplitude weakening and broadening, which is consistent with a disturbance first driven and then evolving into a freely propagating wave. We find two "radiant points" for the Moreton wave fronts on opposite east-west edges of the source region, roughly co-spatial with the bipolar coronal dimming. Type II bursts are known as remote signatures of shocks propagating through solar atmosphere. Thus, the co-spatiality of the associated radio type II burst source and the first Moreton wave fronts indicate that the wave is an initially shocked fast-mode wave launched from an extended region. These findings indicate that the wave is initiated by the CME expanding flanks.

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