

M37a Propagation of MHD Blasts in the Solar Outer Atmosphere — Morteon Waves, EIT Waves and Halo-type CMEs

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A solar flares releases a large amounts of energy in a relatively small volume over a short time period ($10 \approx 100$ seconds). It thus is a large amplitude perturbation for the quiet solar atmosphere. This perturbation excites various types of waves which carry away the energy.

Of the various types of waves generated, we are concerned in this talk with two MHD phenomona, the Morteon wave (observed in Halpha in the solar chromosphere) and the EIT wave, observed in UV lines. Examples of both of these waves exist where the wave propagates relatively isotropically (suggesting that neither wave is the MHD slow mode) and yet with vastly different speeds (the Morteon front moves at a speed of approximately 1000km/s whilst the EIT front moves at approximately 1/3 of that speed).

The theoretical framework for Morteon waves was established by Uchida many years ago. The Morteon wave is the skirt of the MHD fast shock propagating in the solar Corona. In this talk we propose that the EIT wave is similarly the result of the fast mode travelling through the solar corona. This accounts for the similarities (eg they are both isotropic) between the two types of disturbances. The difference between the Morteon wave and the EIT wave is attributed to their representing different phases of the Fast mode disturbance, combined with a mechanism which produces dispersion of the fast mode.