

Moreton waves observed at Hida Observatory of Kyoto University

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When solar flares occur, flare-associated waves are sometimes observed in some wavelengths. Moreton waves are flare-associated waves observed to propagate across the solar disk in H-alpha, and have been identified as the intersection of a coronal MHD fast-mode weak shock and the chromosphere. However, the generation mechanism of a Moreton wave has not been made clear yet.

Hida Observatory have two full-disk H-alpha telescopes; the Flare Monitoring Telescope (FMT) and Solar Magnetic Activity Research Telescope (SMART). We studied the Moreton waves observed with these telescopes.

The FMT observed 20 Moreton waves and/or winking filaments from 1997 to 2005, which is about 1/3 of Moreton waves observed in the world. In all of the Moreton wave events, H-alpha filaments erupted in the same direction after the waves propagated. We consider this point as the clue to elucidate the generation mechanism of the flare-associated wave.

Meanwhile, the SMART, a state-of-the-art telescope, detected triple Moreton waves (shock waves) generated by a solar flare. Interestingly, the first generated Moreton wave was caught up and cannibalized by the faster second one. The cannibalism was also detected in radio wave as the sudden enhancement of the signal. This is the first report of the triple-generated and cannibalistic Moreton waves (shock waves observed in H-alpha).