M37a Dynamics Processes of the Moreton Wave on 2014 March 29

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Shock waves associated with explosive events are fundamental physical processes in solar and stellar plasmas. Their properties and effects have widely been discussed in the framework of magnetohydrodynamics theory. In the Sun's chromosphere a wavelike propagating disturbance, known as Moreton wave, occasionally happens in association with strong flares and Coronal Mass Ejections. In this work we present a study of a Moreton wave that accompanied an X-class flare on 2014 March 29. This event was successfully detected in multiwavelength imaging in Hα line by the Flare Monitoring Telescope (FMT) in operation at Ica National University, Peru. We made use of FMT wing (Hα $\pm$0.8 Å) observations to investigate the dynamic characteristics of the Moreton wave. The Doppler analysis clearly shows a downward motion of the chromospheric material with a velocity of about 2.5 km s^{-1}, at the front of the Moreton wave. On the other hand, the estimated surface velocity of the Moreton wave ranged between $657 - 872$ km s^{-1}. In addition, the coronal plasma responses were also examined, since fast-mode wave propagating in the corona was associated with the event under study. We used Hinode X-Ray Telescope data to derive the plasma condition as the wave propagates in the corona. We complement our investigation with Atmospheric Imaging Assembly data on board SDO, from which the differential emission measure was extracted.