M44a Moreton Waves and Magnetic Topology of Solar Corona

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With the Flare Monitoring Telescope (FMT), 12 Moreton waves have been observed in H-alpha. By quantitative measurement we found that these Moreton waves propagated on the solar surface in a sectorial zone. The directions of Moreton wave propagation are basically co-linear to the associated filament ejections. To explore the magnetic topology of coronal space related to the Moreton wave propagation zone, global potential-field extrapolations based on the composite synoptic magnetograms from the Michelson Doppler Imager onboard the Solar and Heliospheric Observatory are constructed. It is found that Moreton waves propagate to the regions, which have specific magnetic topology. They propagate totally or partly under so called active region interconnecting loops (ARILs), as well as some of Moreton wave propagate partially under active-region loops (ARLs). To scrutinize the magnetic topology effect, we analyzed a typical Moreton wave event on 4 November 1997. We found that there is a weak saddle field configuration (SFC) between the AR 8100 and AR 8102 and the Moreton wave terminated near one of two separatrix lines of the SFC.

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