Session 2

Synthetic Ca II 8542Å Stokes profile of chromospheric magnetic reconnection in emerging flux region

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Magnetic reconnection is an important driving mechanism of many chromospheric phenomena, e.g., UV bursts and chromospheric jets. Information of magnetic field is indispensable for analyzing chromospheric magnetic reconnection, which is mainly encoded in polarization signal. Previous studies suggested Ca II 8542Å chromospheric line as a good candidate for polarization signal studies. We aim to predict possible Stokes features of 8542Å related with chromospheric reconnection events, from realistic 2D MHD simulation and Stokes profile synthesis. Emerging magnetic flux sheet is imposed to imitate the emerging flux region, at the bottom boundary of well-relaxed unipolar atmosphere, which covers from convection zone to corona. The reconnection region is heated to ~8kK and the outflow velocity reaches ~35km/s. Through Stokes profile synthesis, several Stokes features related with reconnections and plasmoids are reproduced. We found direction switch on Stokes V and amplitude reduction on linear polarization at reconnection sites. Also, we report strong linear and circular polarization signals corresponding to huge and tiny plasmoids, respectively. Meanwhile, we discussed the differences of Stokes features between reconnections and shocks. We conclude that chromospheric reconnection could lead to several distinctive polarization features, which could be indicators to discriminate reconnections from other phenomena such as shocks in observation.