M02a Detecting chromospheric magneto-acoustic wave by using Mg II h&k

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NASA's Interface Region Imaging Spectrograph (IRIS) has opened a new window to explore the chromospheric/coronal waves that potentially energize the solar atmosphere. By using an imaging spectrograph covering the Mg II h&k lines as well as a slit-jaw imager centered at Mg II k onboard IRIS, we can determine the nature of propagating magneto-acoustic waves just below the transition region. In this study, we compute the vertically emergent intensity of the Mg II h&k lines from a time series of snapshots of a two-dimensional RMHD simulation of a magnetic element in the solar atmosphere. We use the synthetic line profiles for detecting the slow magneto-acoustic body wave (slow mode) which become a slow shock at the lower chromosphere in the magnetic element. We find that the Doppler shift of the line core gives the velocity amplitude of the longitudinal magneto-acoustic body wave. The contribution function of the line core indicates that the formation of Mg II h&k lines is associated with the propagating shocks and therefore the time evolution of the line core intensity represents the propagating shocks projected on the optical surface. We conclude that the synergy between the imaging spectrograph and the slit-jaw imager onboard IRIS is capable to determine the energy flux of slow modes in the magnetic element. Additionally, we compare the simulations with IRIS observations.