M11c The relationship between the spatio-time structure of flare two-ribbon and MHD Kelvin-Helmholtz instabilities in the flaring corona

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The impulsive nature of magnetic reconnection as an engine of various explosions in the universe is one of the most important problem in plasma astrophysics. On the Sun, the magnetic field energy impulsively released in the corona during solar flares through magnetic reconnection is transferred to the feet of magnetic loops by heat conduction and/or non-thermal electrons heating the chromosphere. The heated plasma forms "two-ribbon" structure at the feet of reconnected magnetic loops as seen from above. The flare two-ribbons seen in chromospheric line emission (such as in Hα) consist of spatially confined "kernels" which brighten intermittently, and sometimes show "wavy" spatial pattern as a whole. Such an evolution is thought to be a result of MHD instability in the flaring corona, such as Kelvin-Helmholtz instability and plasmoid instability. Such spatio-time structure of flare two-ribbons is certainly a precious key to magnetic reconnection dynamics occurring in the corona, which is very difficult to observe directly due to small spatial scale and low emission. We conducted a 3D MHD simulation of solar flare with heat conduction. The numerical simulation reproduced intermittent chromospheric heating and wavy evolution of flare two-ribbons, which resembles the time evolution of observed two-ribbons. We discuss the relationship between the reproduced two-ribbon evolution and the reconnection dynamics in the corona, especially Kelvin-Helmholtz instability which spontaneously evolve with the existence of the guide field.