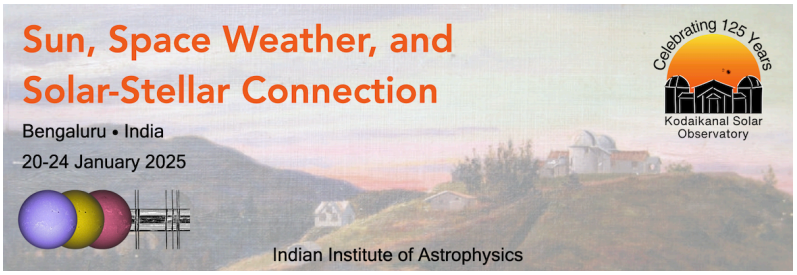

Contribution ID: **79** Type: **Poster**

Numerical Modeling of Multiple Magnetic Reconnection in Chromospheric Current Sheet

The solar chromosphere possesses complex magnetic structuring and plasma dynamics at diverse spatio-temporal scales. Using MPI-AMRVAC, we have modeled the chromospheric magnetic reconnection process by externally perturbing a localized horizontal current sheet (CS) in the presence of radiative cooling and thermal conduction. Due to the an applied pressure gradient across the CS, the magnetic fields are trying to primarily reconnects at the centre of the CS, generating bidirectional plasma outflows. A central steady plasmoid is formed in the CS. After a certain time, two X-points are formed within the CS, on either side of the central plasmoid. at both the sides of the central region of the CS. This causes multiple reconnections at those X-points. In this entire process reconnection takes place in those locations during which, the magnetic energy is converted into joule heating, kinetic energy and internal energy. The outflow speed is about 20 km/s that is equivalent to the speed of observed typical cool chromospheric jets. The average temperature of the cool chromospheric plasma is elevated up to upper chromospheric temperature at around 21104 K. We further include ambipolar diffusion and ionisation fraction in our simulation. In the case of weakly ionised plasma and in the presence of ambipolar diffusion, the temperature remains almost constant in the later phase of magnetic reconnection.

Contribution Type

Theme

Energetic Phenomena

Primary author: Mr BAIRAGI, Akash (Research Scholar)

Co-authors: Prof. SRIVASTAVA, Abhishekh Kumar (Professor at Department of Physics, IIT(BHU)); Prof. PONTIN, David I. (Professor at School of Information and Physical Sciences, University of Newcastle, Australia); Prof. PRIEST, Eric R. (Professor at Mathematics Institute, St Andrews University, UK); Mr MONDAL, Sripan (Research Scholar at Department of Physics, IIT(BHU), Varanasi)

Presenter: Mr BAIRAGI, Akash (Research Scholar)