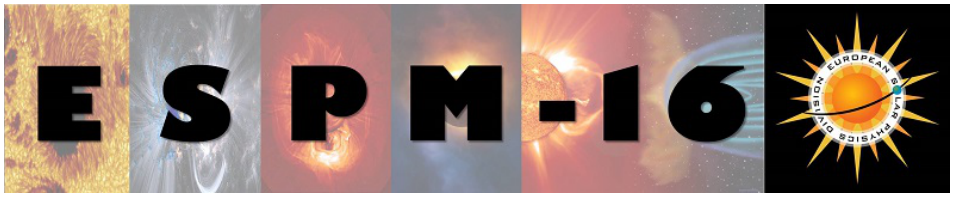

Contribution ID: **425** Type: **Poster**

Effects of supra-arcade downflows interacting with the post-flare arcade

Monday, 6 September 2021 11:50 (13 minutes)

Supra-arcade downflows (SADs) are tadpole-shaped dark voids that descend through the cusp-shaped field lines of the current sheet and observed throughout the prolonged flare decay phase. Therefore, probing the thermodynamical and magnetic nature of the SADs can offer new insights into the reconnection mechanism during the flare gradual phase. Here, we investigate six distinctively clear episodes of SADs observed during the decay phase of an M-class flare of April 11, 2013. Unlike previous SAD investigations mainly targeting the limb flares, the selected on-disk located flare (AR11719) offers a unique opportunity of probing the effects of the interaction of SADs with the post-flare loop arcade and foot-points. Besides known effects, such as the generation of transverse waves (Period~160s) in the supra-arcade field lines followed by the passing of the void, our analysis revealed new facts presented as follows. DEM analysis of the SAD cases that occurred close to the flare-maximum revealed to contain hot plasma of temperature 5-7 MK. SADs collision with the post-flare loop arcade resulted in hot plasma of 10 MK temperature at the collision site and generated EUV intensity perturbations expanding and propagating with a speed ~400 km/s. In contrast, striking signatures of foot-point brightening (AIA/SDO 1700Å) are observed immediately after the SAD's interaction with cusp-shaped loops (time-delay 20-32 sec; perturbation propagation speed ~ 2100 km/s). Further, UV emission from the ribbon location exhibited a periodicity of 10-minute, similar to the SAD occurrence rate, thus indicating its definitive contribution in the often observed quasi-periodic nature of flare emission.

Primary authors: Dr AWASTHI, Arun (University of Science and Technology of China); Prof. LIU, Rui (CAS Key Laboratory of Geospace Environment, Department of Geophysics and Planetary Sciences, University of Science and Technology of China, Hefei 230026, China)

Presenter: Dr AWASTHI, Arun (University of Science and Technology of China)

Session Classification: Poster Session 1.5

Track Classification: Session 4 - From Radio to Gamma Rays: Near-Sun Manifestations and Triggering of Solar Flares and Coronal Mass Ejections