



Contribution ID: 177

Type: **Poster**

Understanding Precursors of Coronal Mass Ejections and Flares

Coronal mass ejections (CMEs) and solar flares are the most energetic explosive phenomena in our solar system and are able to release a large quantity of plasma and magnetic flux into the interplanetary space, probably affecting the safety of human high-tech activities in the outer space. To predict CME/flares caused space weather effects, we need to elucidate some fundamental but still puzzled questions, one of which concerns how are CME/flares initiated. In this talk, I will first present key observational characteristics before the main phase of CME/flares including the slow-rise precursor and pre-flare activities. I then show a MHD model aiming to understand these disclosed observational characteristics and propose a new CME/flare initiation paradigm.

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Session Classification: Coffee break and poster session 2

Track Classification: Multi-scale energy release, flares and coronal mass ejections