

Timestamp: 6/20/2016 9:06

Title of Proposed Observation:

Joint Observation with IRIS and BBSO/NST for Filament and Flare

Main Objective:

Filament formation and the relationship between flare and filament in different levels

Scientific Justification:

Solar flares are one of the most energetic phenomenon that are closely related with the eruption of filaments (Aulanier et al. 2010). A huge amount of free magnetic energy ($10^{28} - 10^{32}$ erg) would be released into other kinds of energy, such as the thermal energy and kinetic energy of solar plasma and that of energetic particles. Theoretically, many ideal magneto-hydrodynamic (MHD) instabilities have been proposed to explain the solar eruption (Torok et al. 2004; Kilem & Torok 2006). While the realistic conditions are usually much more complex, thus detailed observation of the dynamic evolution of solar flare is important for understanding its physical nature.

Solar filaments are cold and dense plasma suspending in the solar corona (Tandberg-Hanssen 1995). On one hand, they could be very steady and have a lifetime of days or weeks. On the other hand, their eruptions could be the trigger of solar flares (Mackey et al. 2010). High resolution observations revealed that they are composed of a collection of separate threads which have a typical length of only 2-20 Mm (Lin et al. 2005). Although the fortuitously eruption of filaments is an attractive topic, more attentions should be paid to the formation and oscillation of the filaments, or more specifically, these motions in threads, which are important for us to understand the physics process of plasma in the solar corona. With the help of high-resolution images and spectrograms from NST, a better knowledge of the solar flare and filament, and hopefully their relationship would be achieved.

Aulanier et al. 2010, ApJ, 708, 314
Chen et al. 2014, ApJ, 784, 50
Kliem, B. & Torok, T. 2006, Physical Review Letters, 96, 255002
Torok et al. 2004, A&A, 413, L27
Tandberg-Hanssen, E. 1995, The Nature of Solar Prominences
Lin, Y et al. 2005, Sol. Phys, 226, 239
Mackey, D. et al. 2010, Space Sci. Rev., 151, 333

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Dates: 2016/08/13 – 2016/08/18

Time window: 18:00 UT – 21:00 UT

Target(s) of interest: Active region that has a high possibility to produce a flare. In addition, a filament should be included, since the eruption of a filament is closely related with solar flares. On-disk observation is requested.

SOT Requests:

SP, Fast map mode, 82" × 82" , 4 min cadence

EIS Requests:

EIS Study ID 458:

ACRONYM: CAM FLARE DIAG

TARGET : Small Active region

Exposure time: 5 s

Compression: DPCM

EXPOSURE TIME : 5 s

RASTER : Scanning

SLIT : 2"

STEP SIZE : 3"

DATA COMP. : JPEG90

FOV : 60" × 120"

LINES : Mg V, Si VII, Fe XI, Fe XIII, Fe XIV, Fe XVI, Ca XV, Fe XVII, Fe XXIII, Fe XXIV.

XRT Requests:

Al-poly FOV: 192 × 192 , high-cadence Al-poly flare response.

Be-thin FOV: 192 × 192 , high-cadence Be-thin flare response.

IRIS Requests:

High telemetry version with OBS-ID 3660009033 and low telemetry version with OBS-ID 3660107033.

Additional instrument coordination:

BBSO/NST

Previous HOP information:

New proposers

Additional Remarks: