

**Timestamp:** 5/13/2016 18:30:06

**Title of Proposed Observation:**

Magnetic field in and around explosive granules

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**SSC Point of Contact:** SOT -- Dick Shine (LMSAL)

**Main Objective:**

The objective of this project is the measurement of the magnetic field around and in explosive granules at high spatial resolution.

**Scientific Justification:**

This type of analysis has already been conducted using data from Sunrise / Imax (J. Palacios et al. A&A 2012 537, 21) but for very short time periods (18 and 21 minutes). A combination of Hinode SP (IQUV) observations and IRIS Slit Jaw at 2832 Angstrom during at least 6 hours will allow us to study the relationship between exploding granules and the magnetic field and also their link with Trees of Fragmenting Granules (TFGs). Such a sequence will give us access to many successive explosions which is important for understanding the number of explosions necessary to concentrate the magnetic field at the edges of these explosive granules. These explosive granules are the most dynamic elements of the solar photosphere and contribute to their development through the formation of a "Tree of Fragmenting Granules" (granules families) whose actions are related to magnetic network formation in the quiet sun (Roudier et al. A&A April 2016; DOI: 10.1051/0004-6361/201628111, <http://arxiv.org/pdf/1604.04118v1.pdf>).

**Dates:** ToO

**Time window:**

6 hours continuous overlap observations required with SOT and IRIS, single day, any time window is acceptable

**Target(s) of interest:**

Quiet Sun, disk center (0,0), with Hinode tracking (solar rotation compensation)

**SOT Requests:**

SP: 3.2 arcsec x 122 arcsec mapped in 100sec Stokes parameters IQUV

**EIS Requests:**

None

**XRT Requests:**

None

**IRIS Requests:**

1. High data rate: 3600256836 | Large dense 16-step raster 5"x120" with Si IV (1400) Mg II h/k (2796) Mg II w (2832) slit-jaw images. This has a raster cadence of 86 seconds and rasters a similar region as SP. The field-of-view of the slit-jaw images is 120"x120". The cadence is 21.6 seconds for each flavour of the slit-jaw channels. This will also give chromospheric (2796) and TR (1400) coverage.

2. Low data rate: 3600256835 | Medium dense 16-step raster 5x60 16s Si IV Mg II h/k Mg II w Deep This is the same as no. 1 except that the FOV is 5"x60" for the raster and 60"x60" for the slit-jaw images.

Request IRIS roll to increase probability of overlapping SOT SP field of view.

**Additional instrument coordination:**

None

**Previous HOP information:**

HOP 295 (2015)

Recent resulting publications: Roudier, T., Malherbe, J.-M., Rieutord, M., Frank, Z.: 2016, "Relation between trees of fragmenting granules and supergranulation evolution", accepted in *Astronomy and Astrophysics* (April).

Malherbe, J.-M., Roudier, T., Frank, Z., and Rieutord, M.: 2015, "Families of Granules, Flows, and Acoustic Events in the Solar Atmosphere from Hinode Observations," *Solar Physics* 290, 321

**Additional Remarks:**

Additional information: A similar program run over a 24 hour period and in 6 hour slots on a latitude/longitude grid would be a useful extension of this proposal or future HOP requests for consideration.