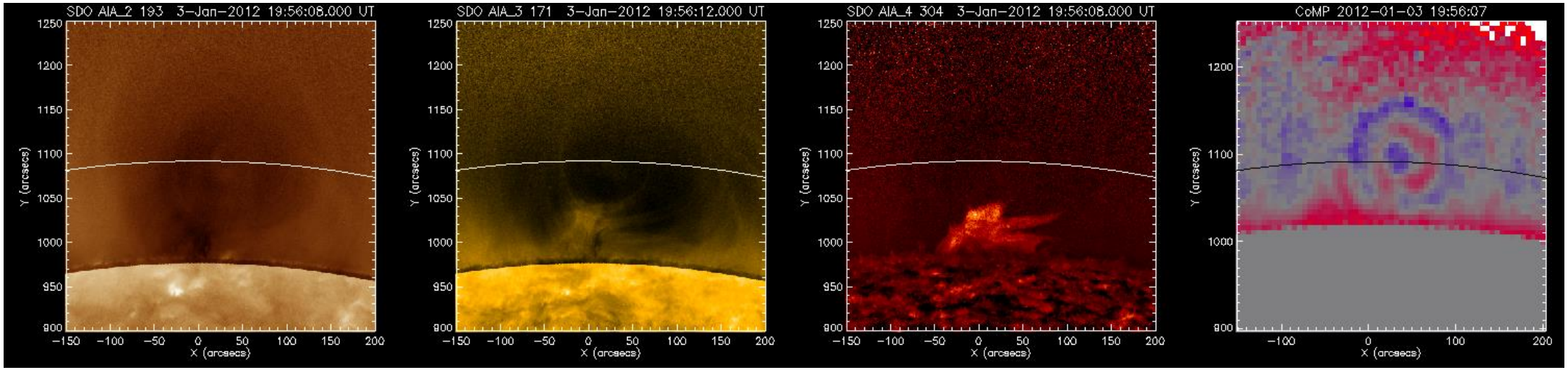
Erupting cavity observed on 15 May 2012

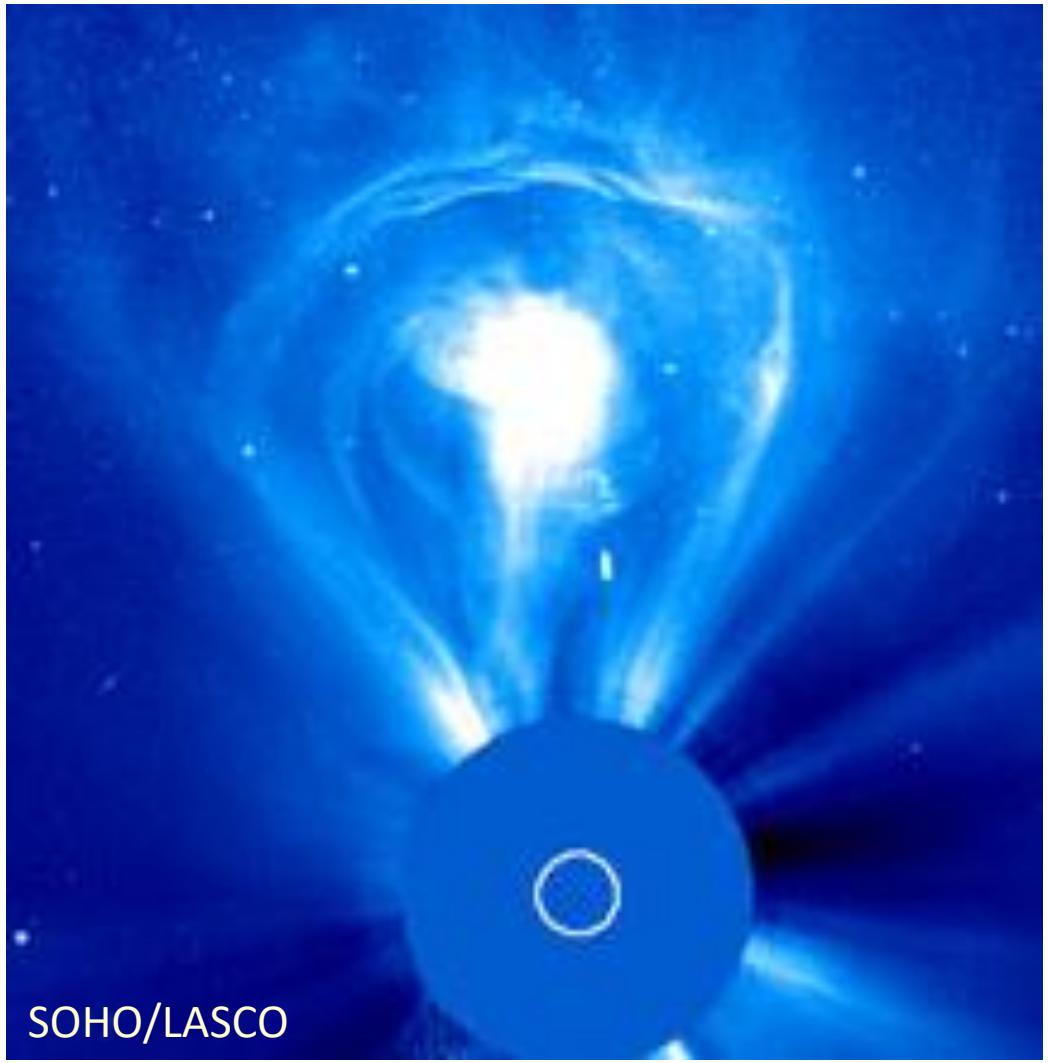
Urszula Bąk-Stęślicka[1], Marek Stęślicki[2], Yuhong Fan[3], Sarah E. Gibson[3]

[1] Astronomical Institute, University of Wrocław, Poland

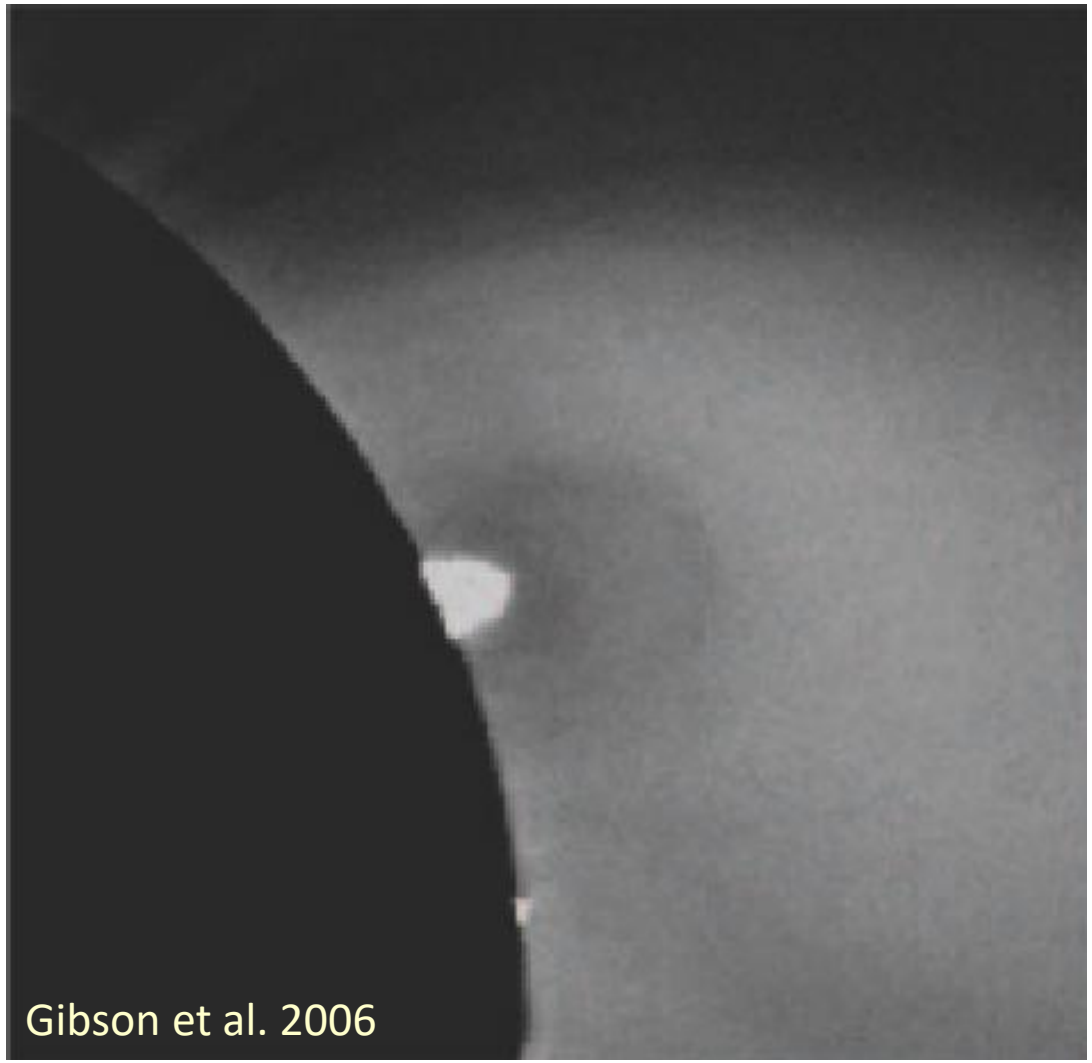
[2] Space Research Centre, Polish Academy of Sciences, Poland [3]High Altitude Observatory, NCAR, Boulder



Coronal cavities



Illing & Hundhausen 1986



Vaiana et al. 1973
Tandberg-Hanssen 1974

Coronal cavities

- Cavities are dark region of rarefied density with elliptical cross-section (Fuller & Gibson 2009, Gibson et al. 2010)

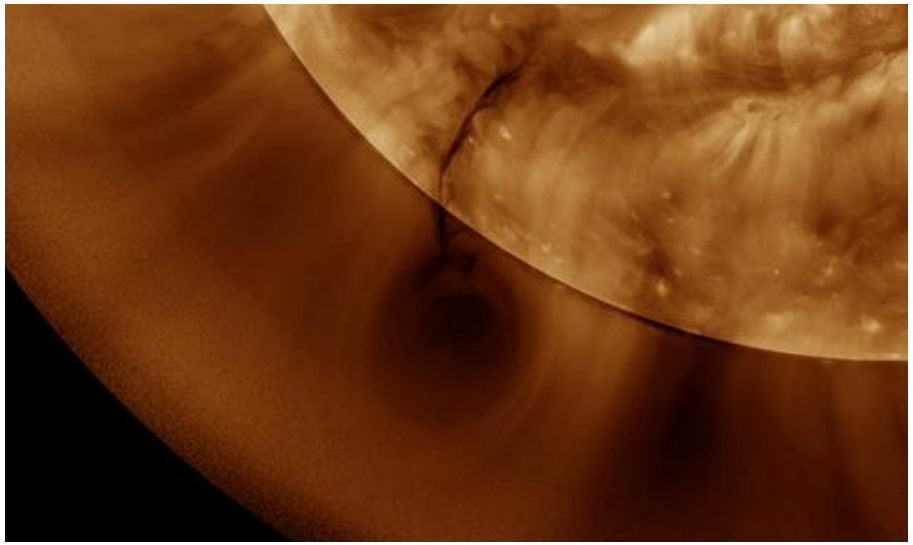
- First observations during the solar eclipse in 1898 r. (Wesley, 1927), the first interpretation - Waldmeier (1941)

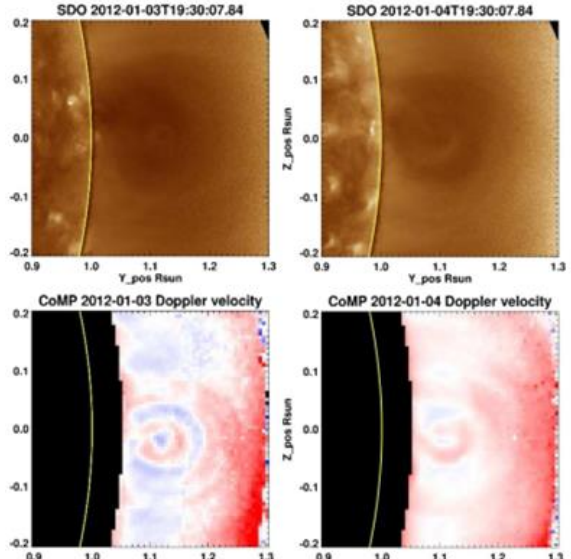
- Observed in WL, SXR, EUV, radio (Hudson et al. 1999; Hudson & Schwenn 2000; Sterling & Moore 2004; Heinzel et al. 2008, Reeves et al, 2012, Marque et al. 2002; Marque 2004)

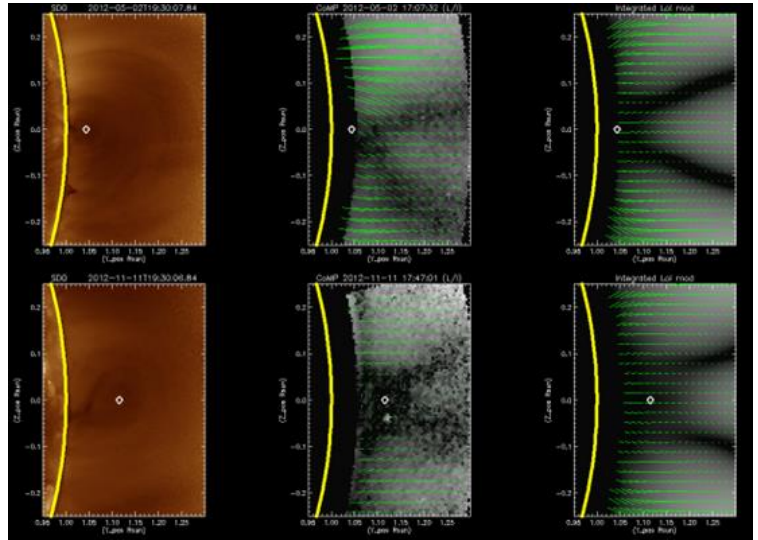
- Different shape and length (Forland et al., 2013; Karna et al., 2015)

- Even when not erupting, they have flows associated with them (Berger et al, 2008; Schmit et al, 2009; Li et al, 2012, Bąk-Stęślicka, et al. 2016)

- Characteristic structrures in linear polarisation (Bąk-Stęślicka, U. et al. 2013) - **see Agnieszka Rumińska presentation**



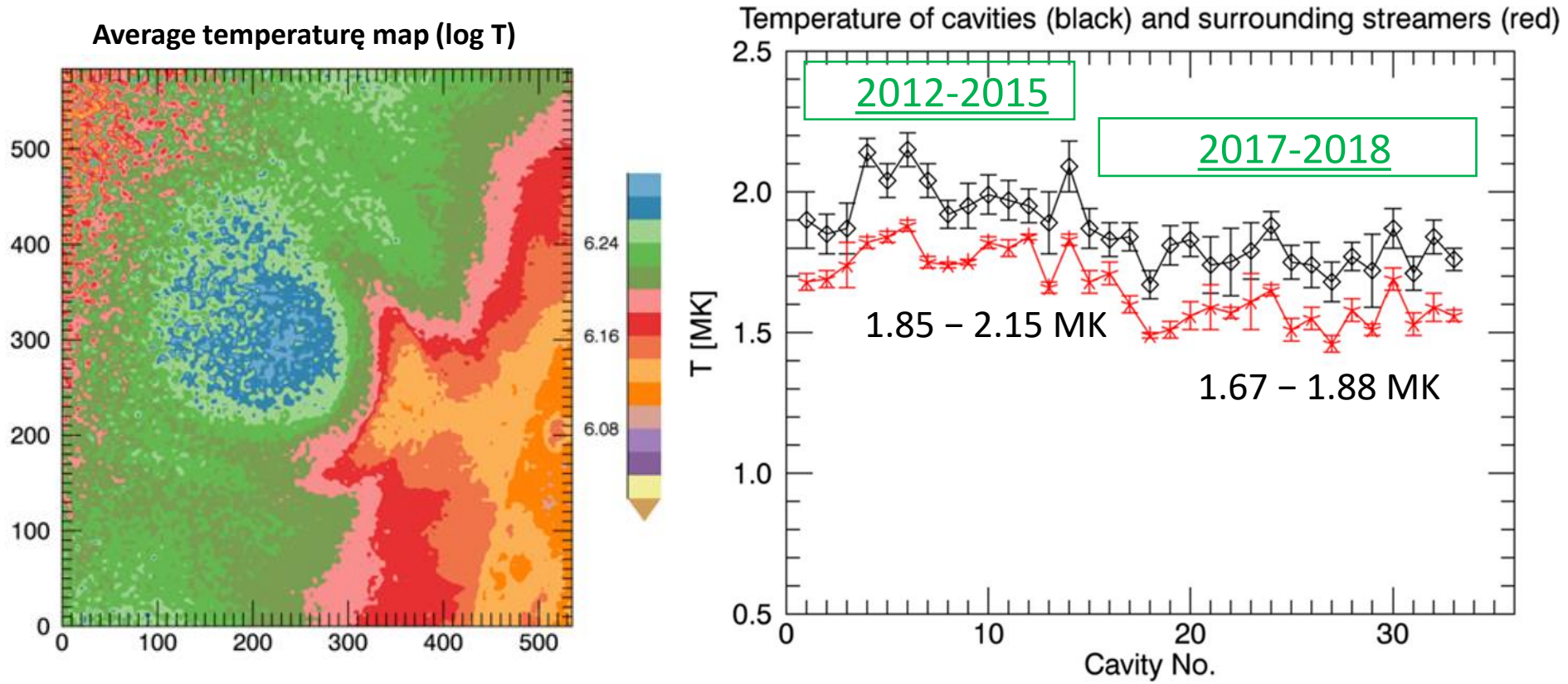




Thermal properties of coronal cavities

Guhathakurta et al., 1992; Kucera et al., 2012; Hudsonet al.,1999; Hudson and Schwenn, 2000; Fuller et al., 2008; Vasquez, et al., 2009; Habbal et al., 2010; Reeveset al., 2012; Bąk-Stęślicka et al., 2019

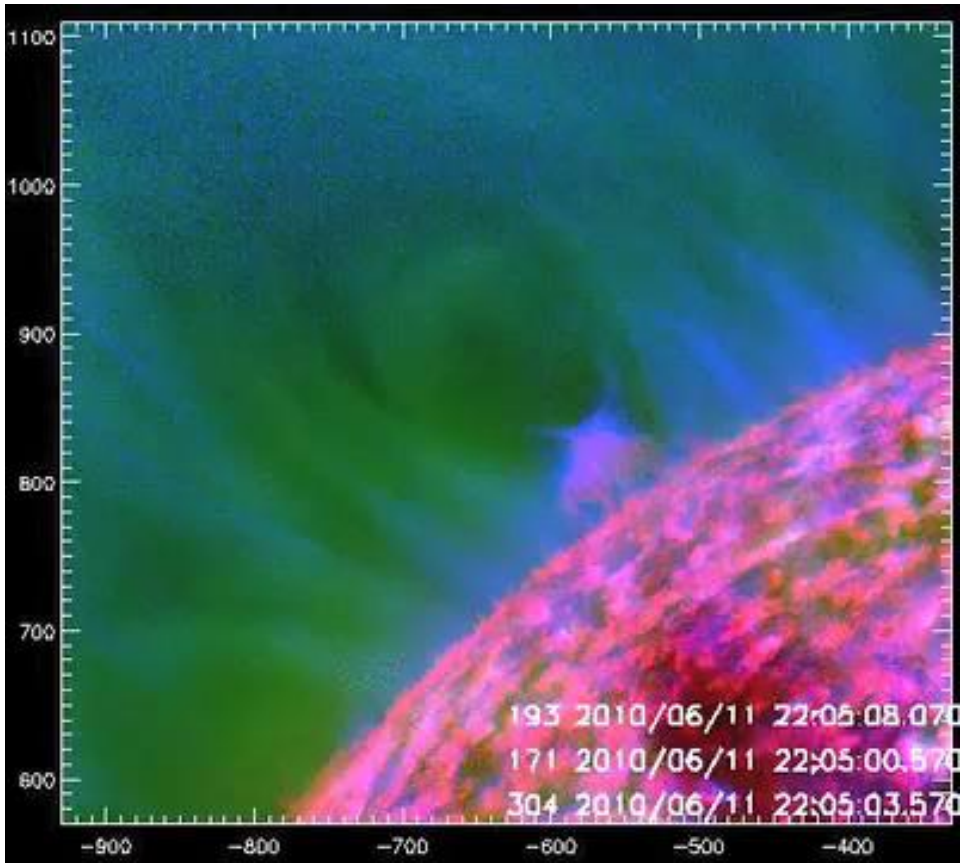
- Cavities are hotter than surrounding streamers (Bąk-Stęślicka et al., 2019)



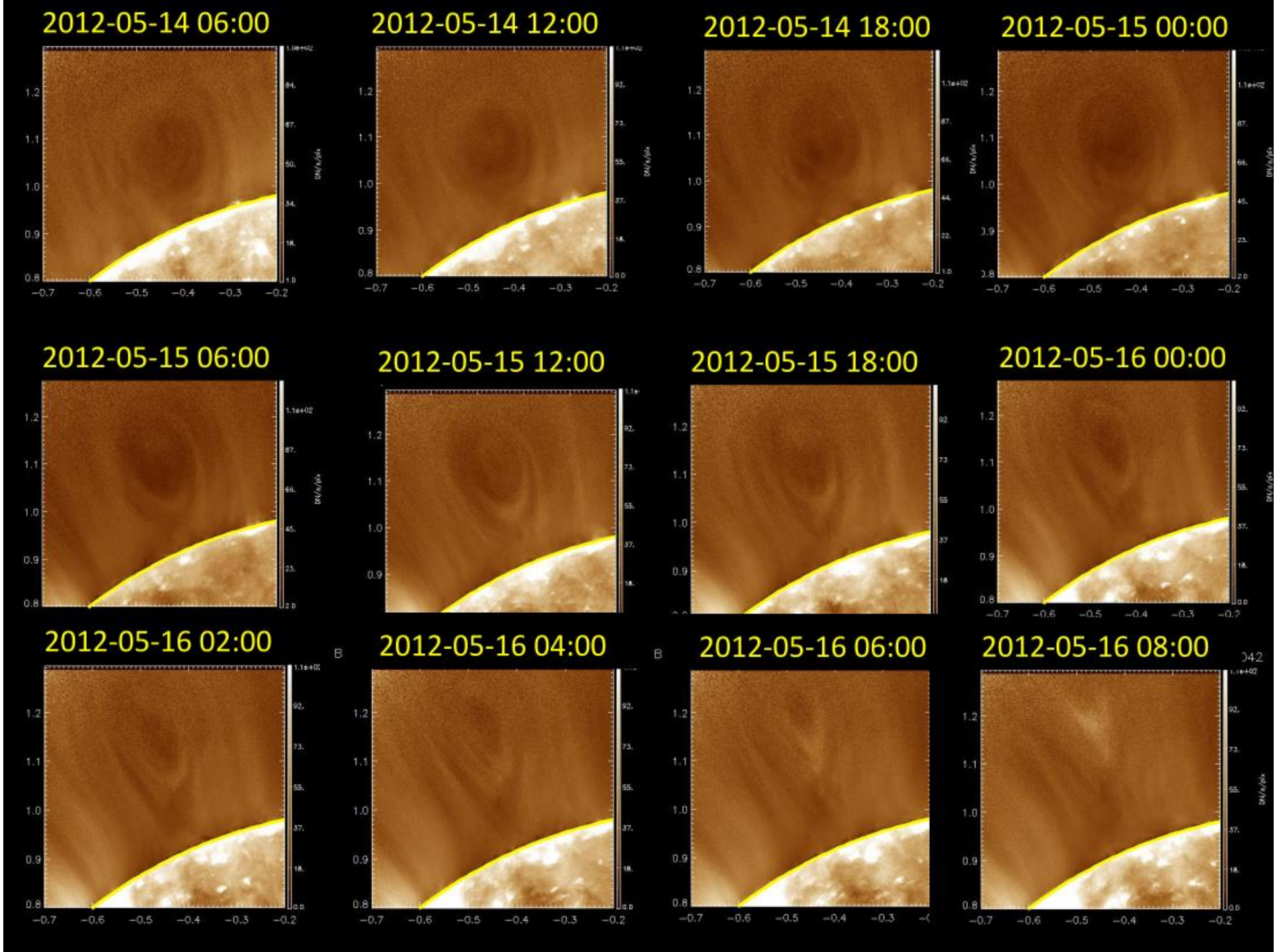
Coronal cavities

- Cavities observed in the polar crown regions surround quiescent prominences (Tandberg - Hanssen 1995). They are long-lived (Gibson, 2006), their structure changes slowly with time.

- Eruption of a previously quiescent cavity as a CME (Maričić et al., 2004; Gibson et al. 2006, Regnier et al. 2011).



S. Gibson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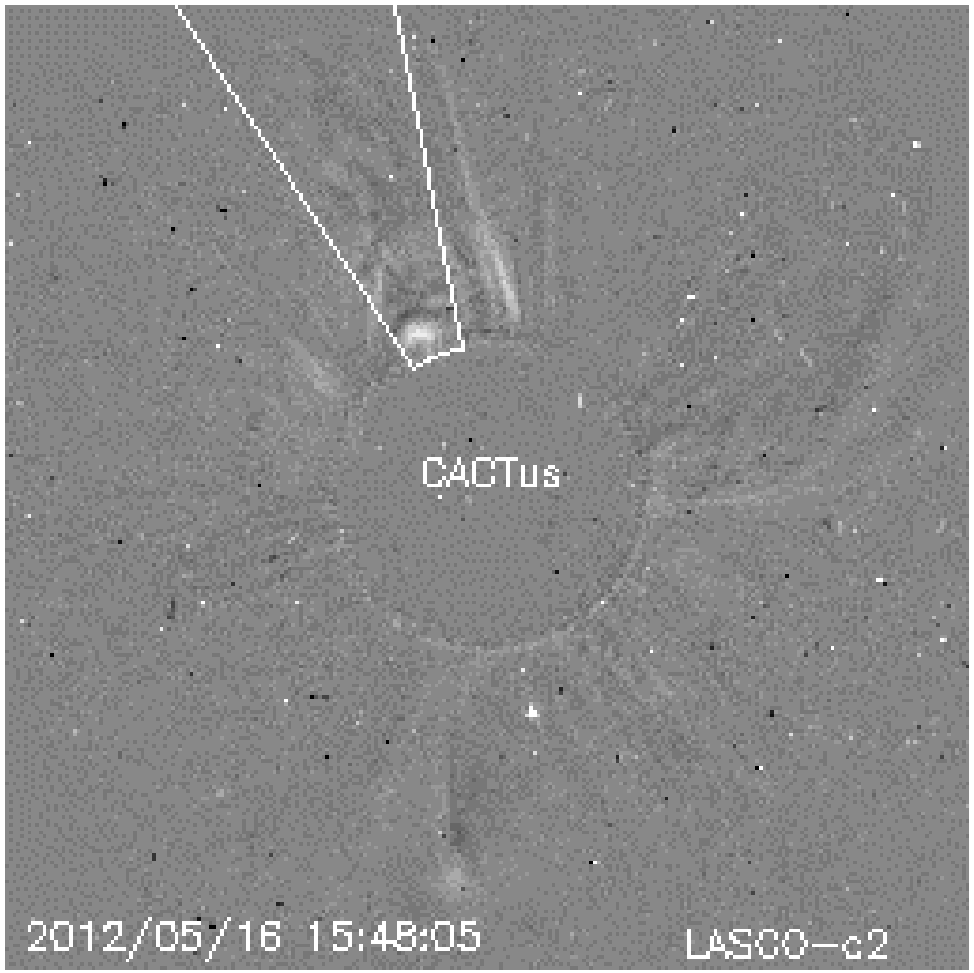
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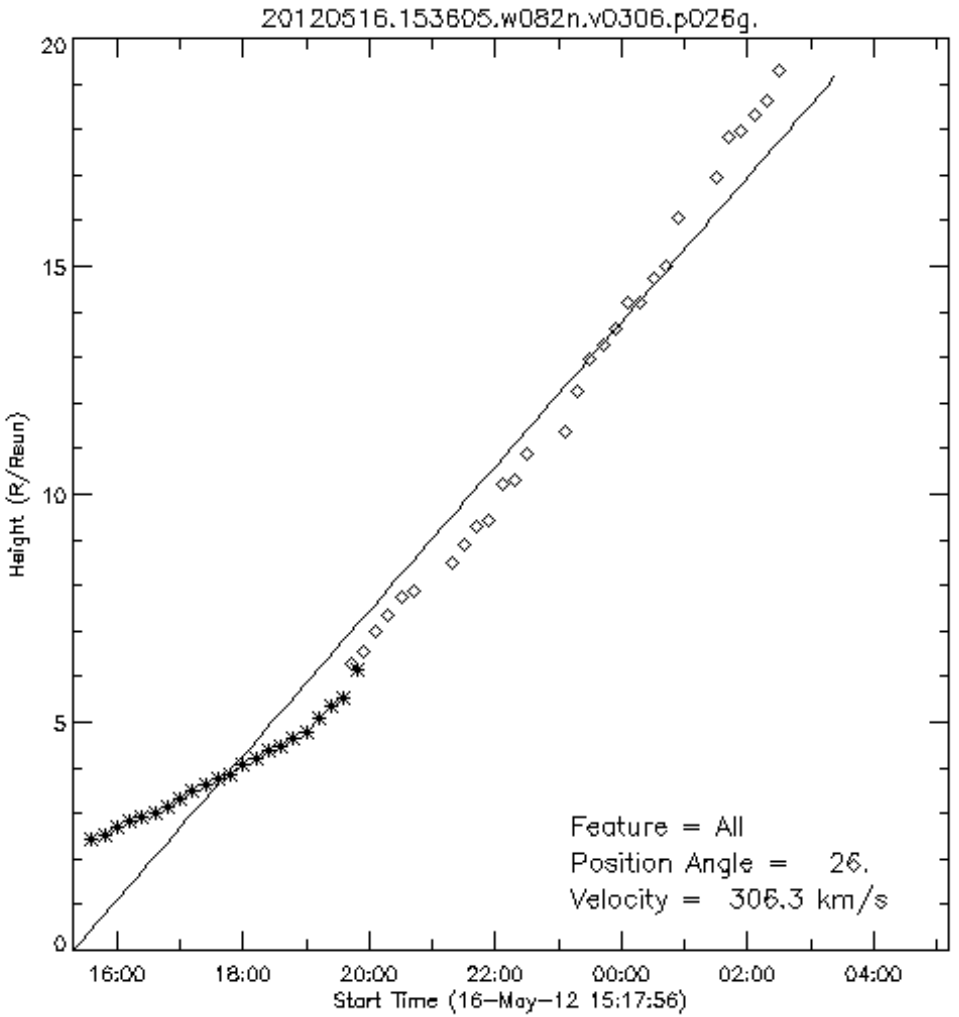
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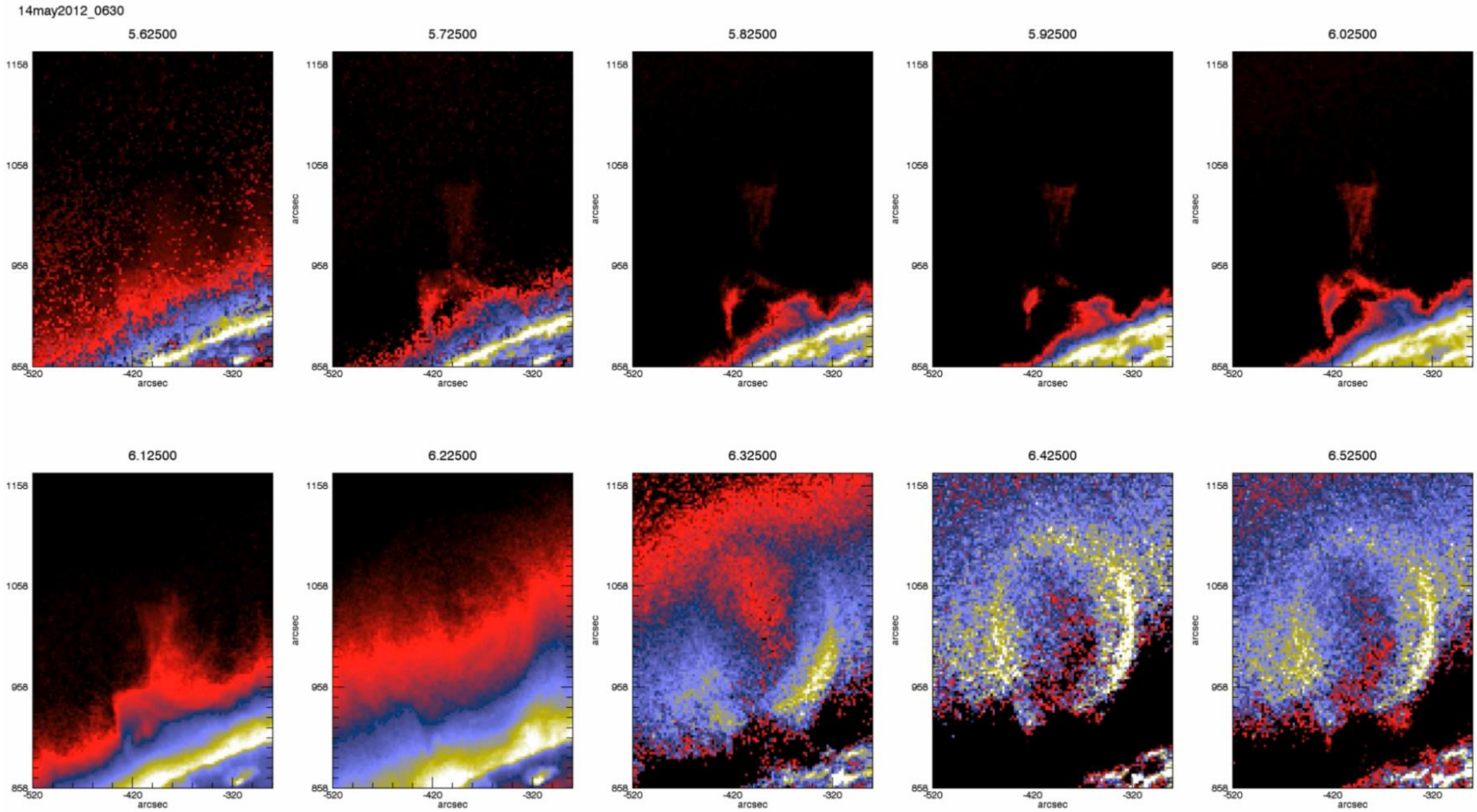
The regularization method - Hannah & Kontar, 2012



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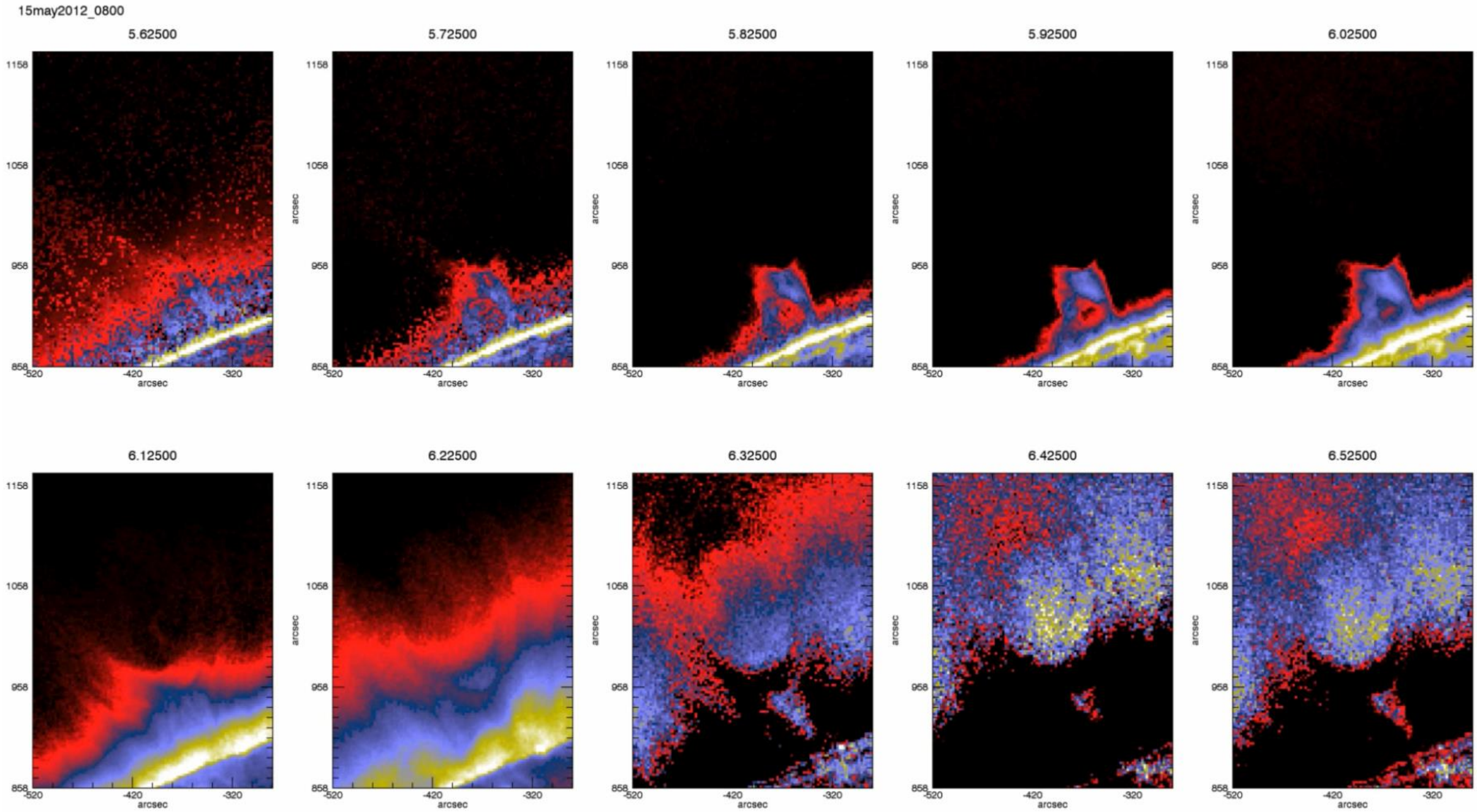

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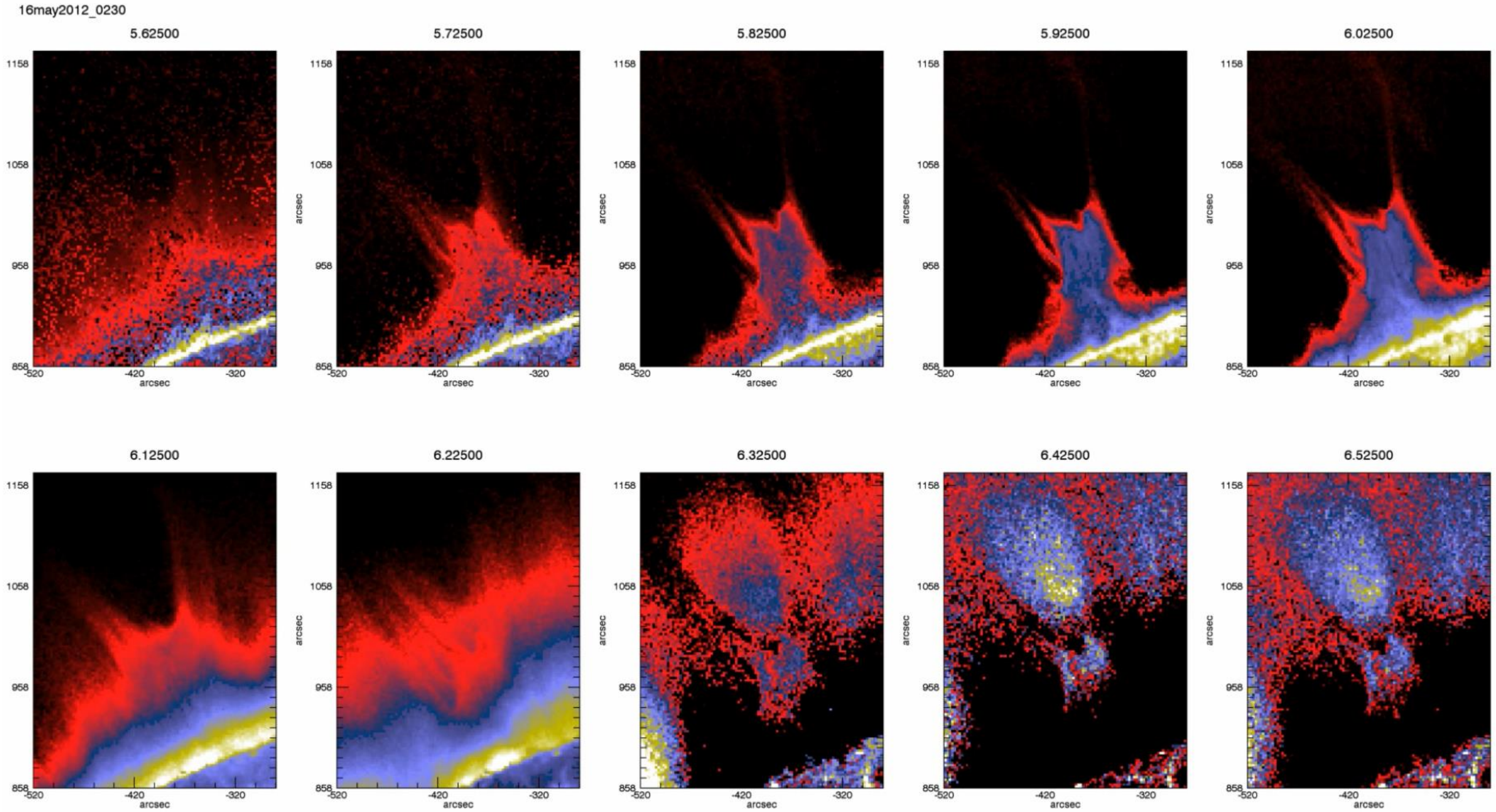

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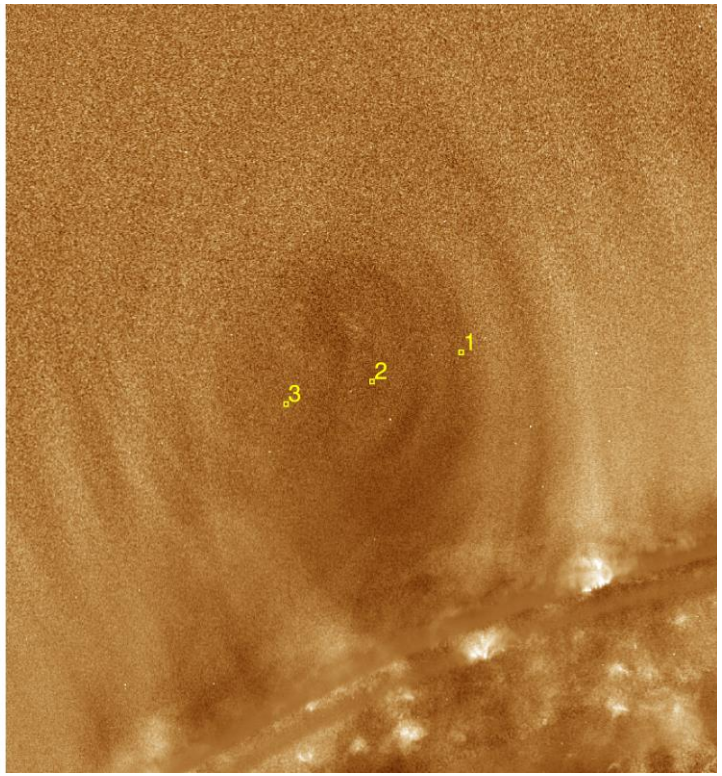

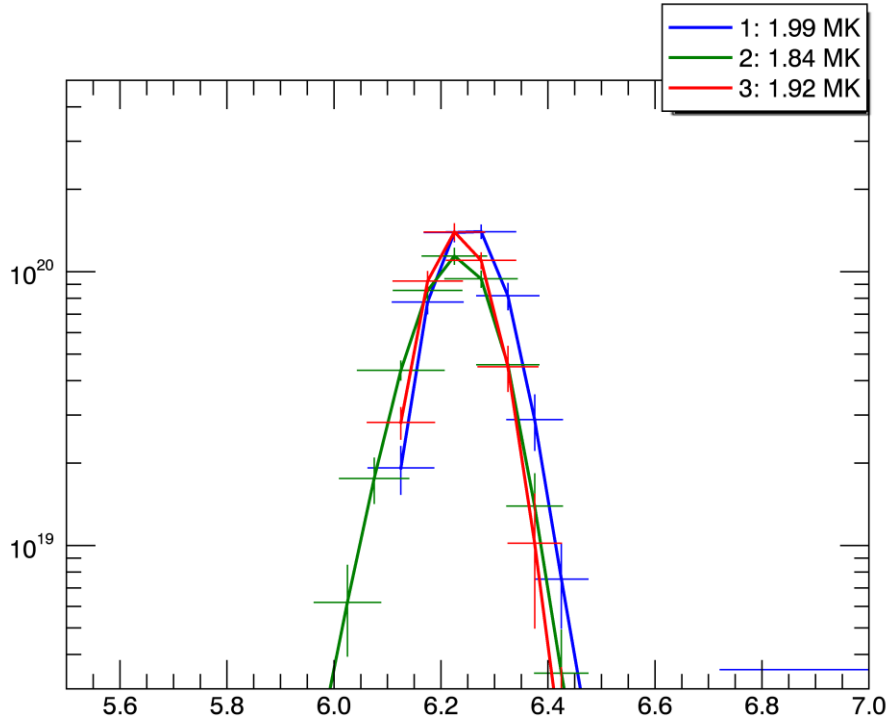

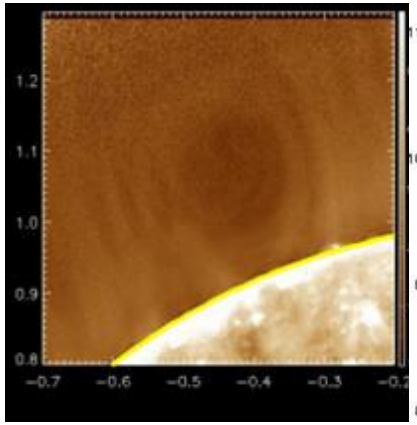

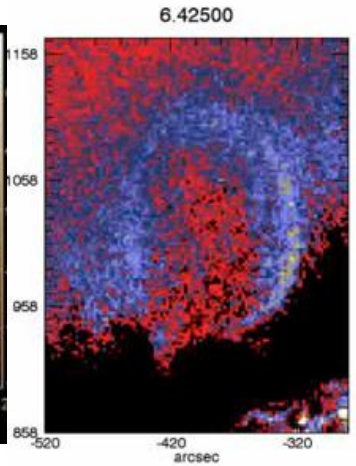

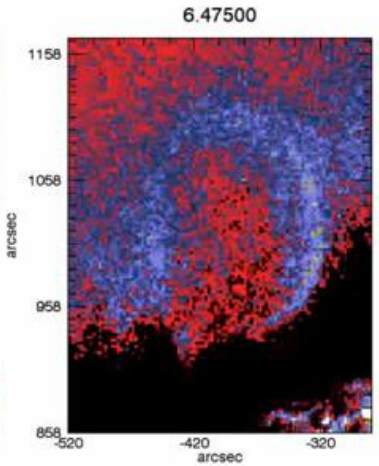

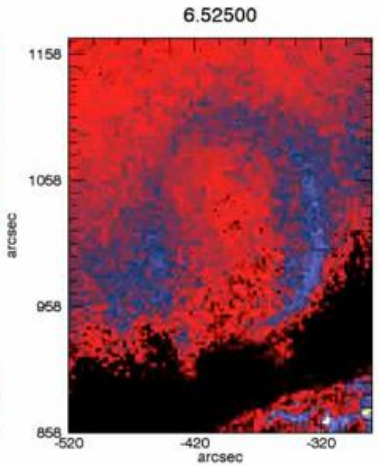

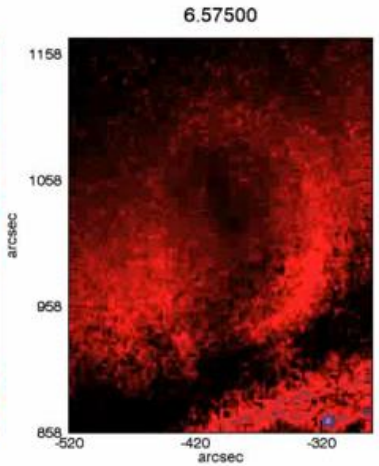

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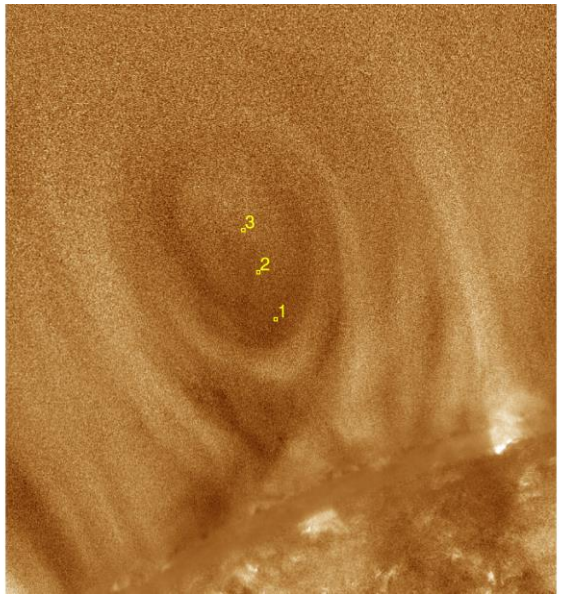

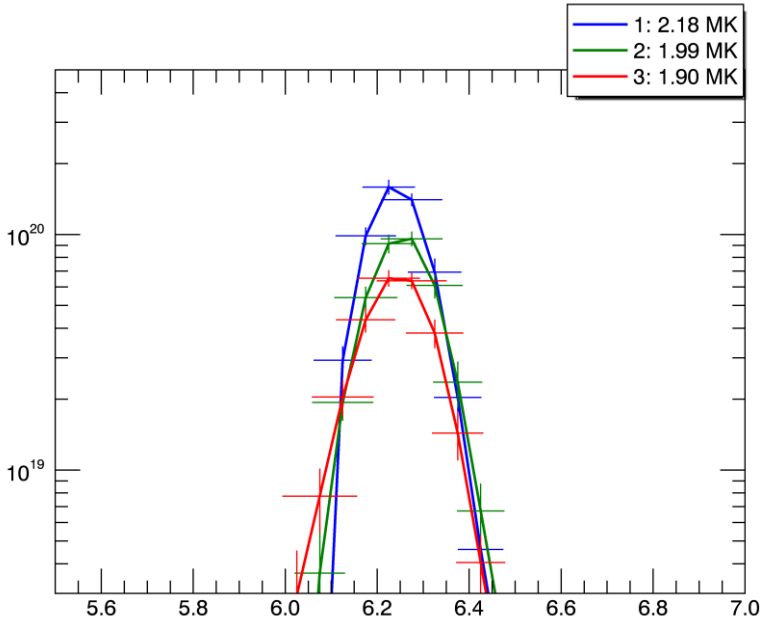

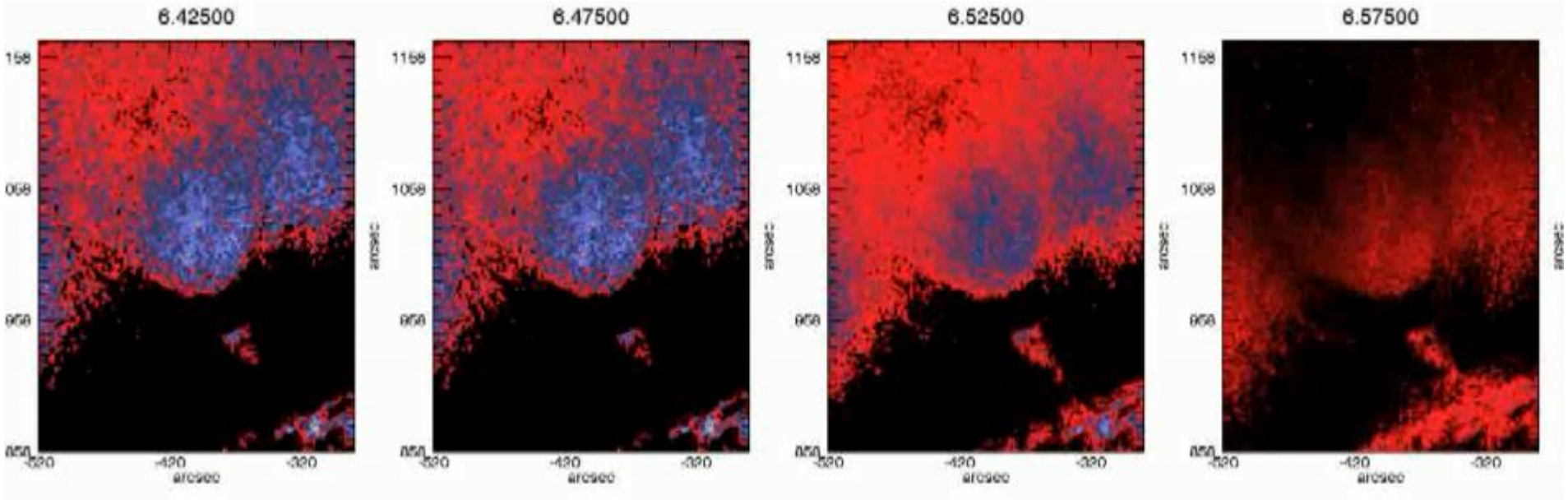

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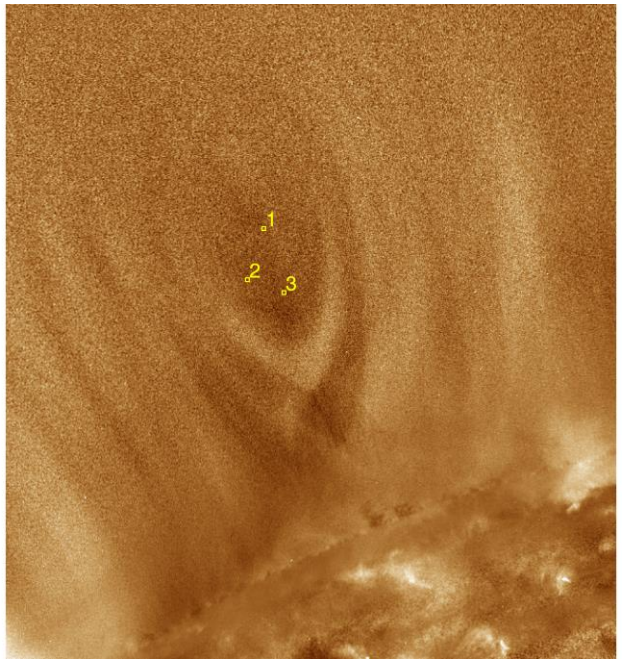
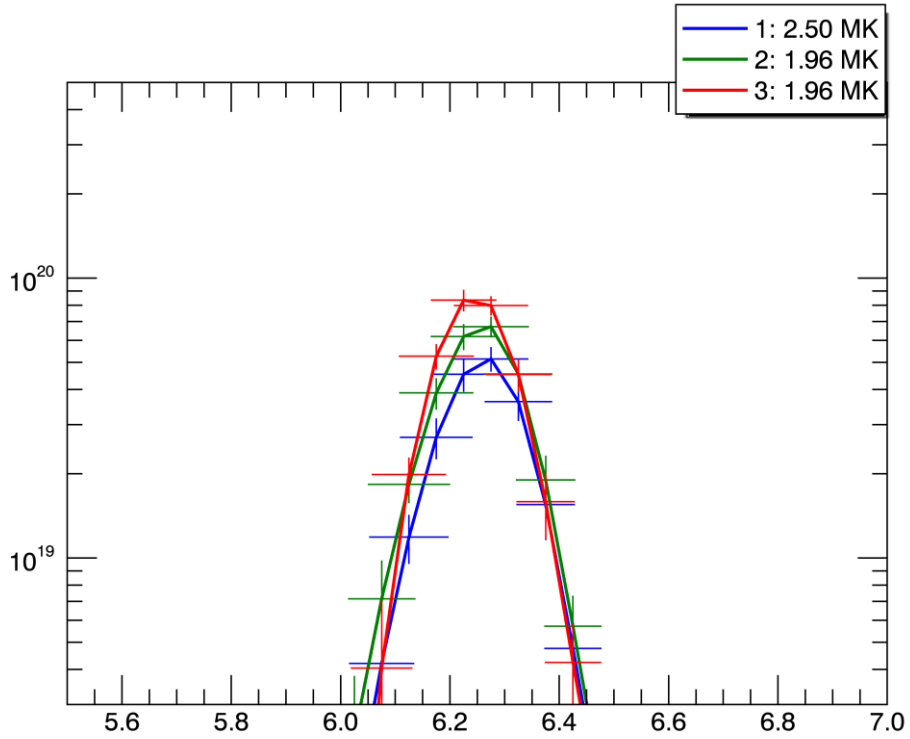
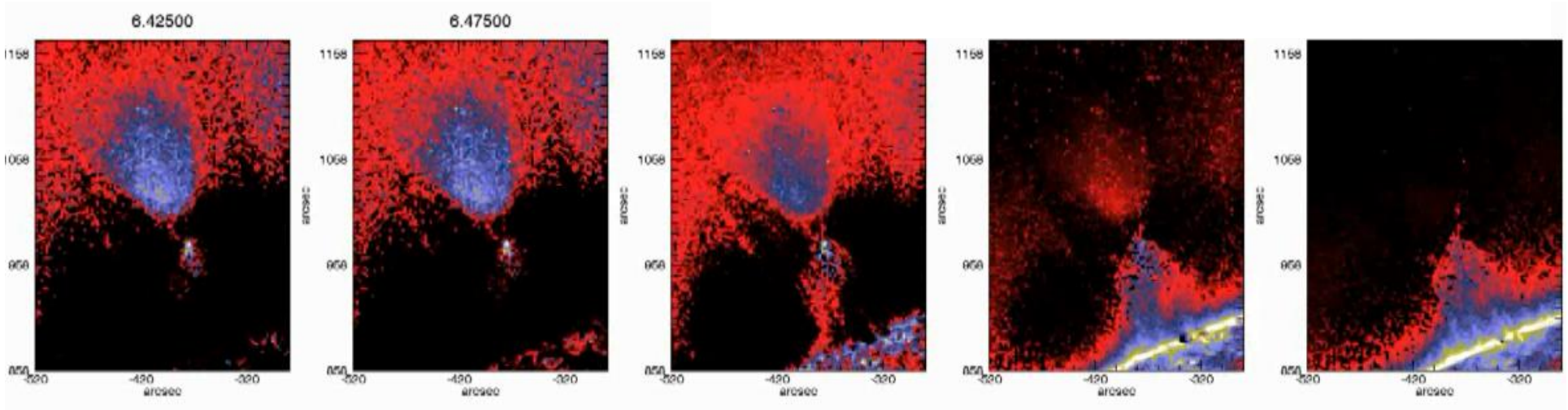
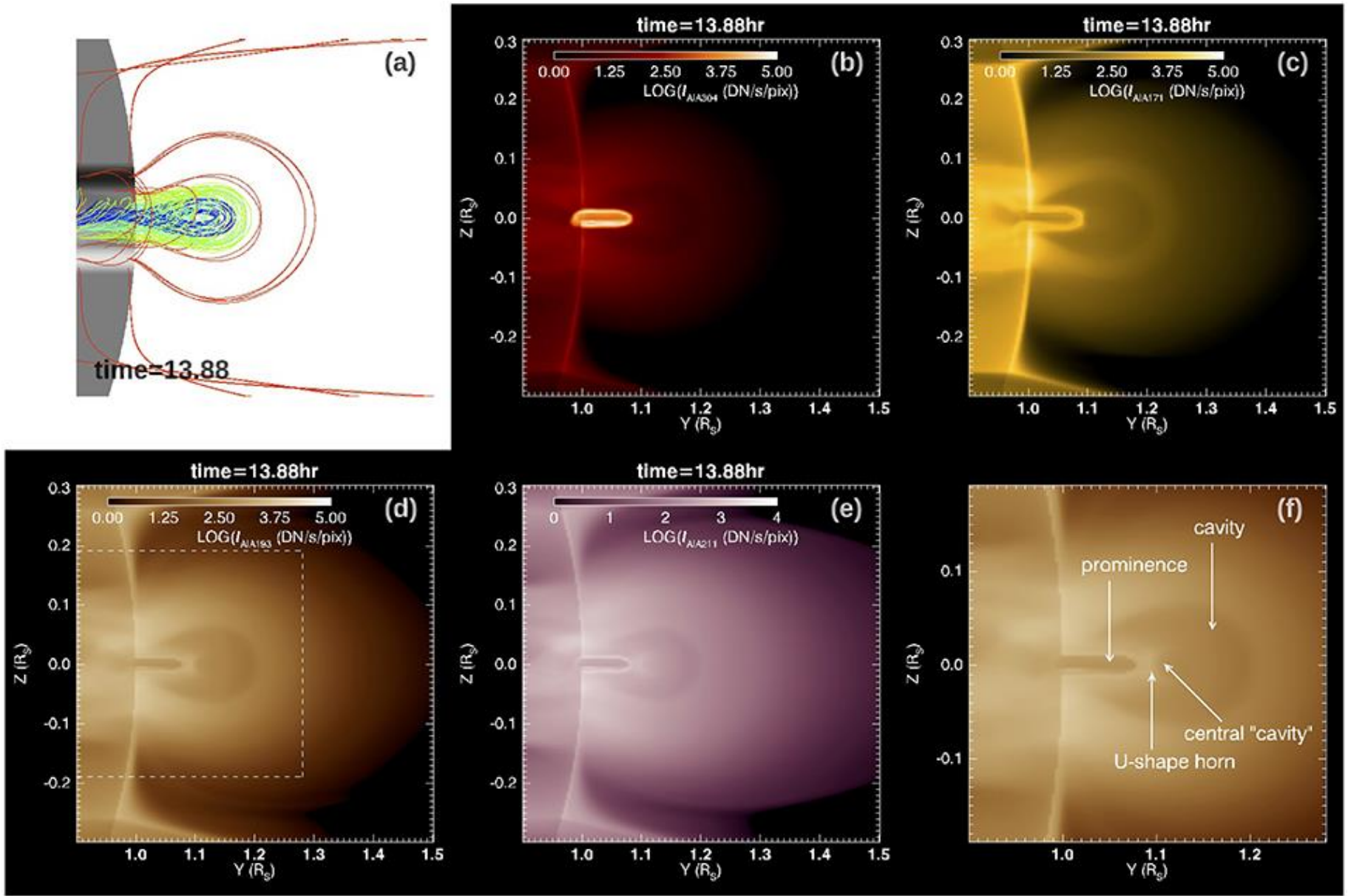






MHD model (Fan 2019)



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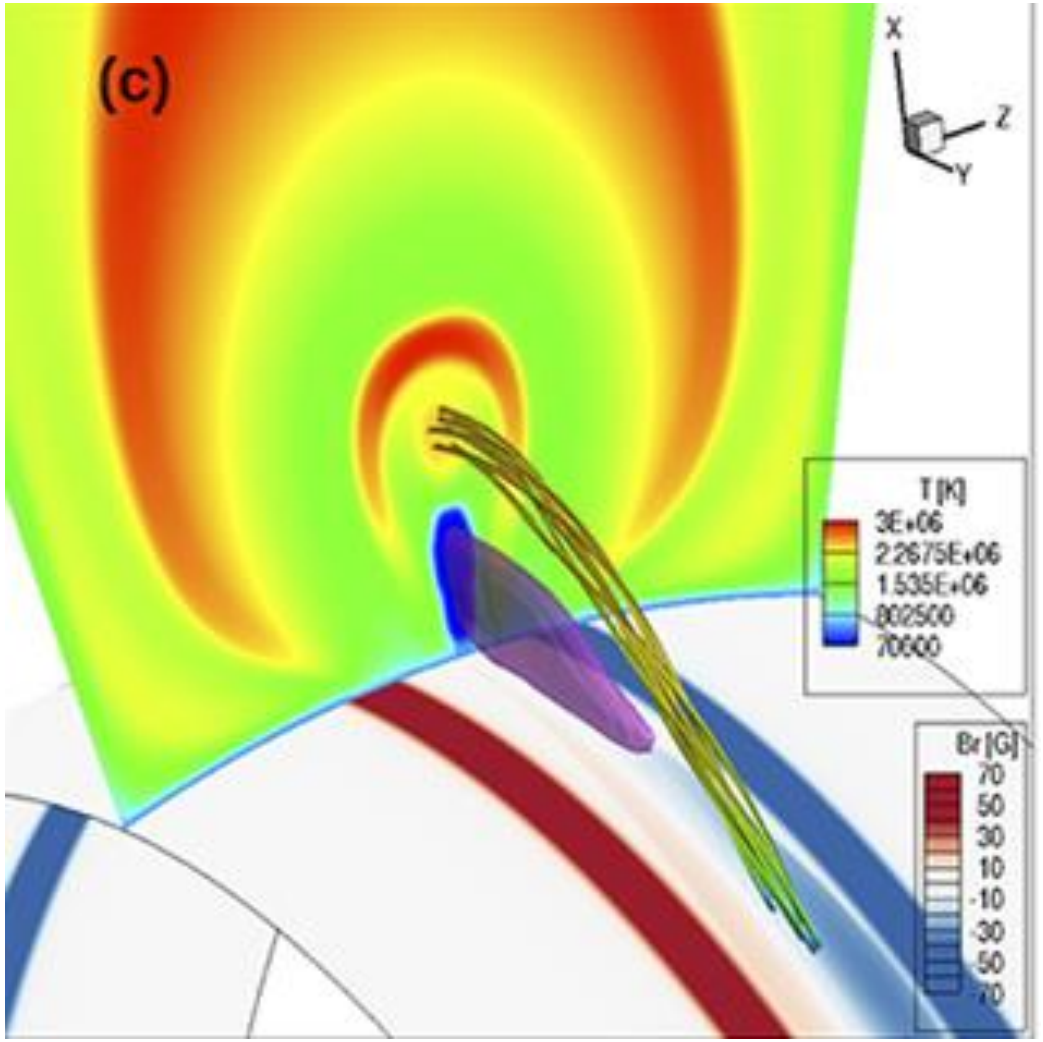

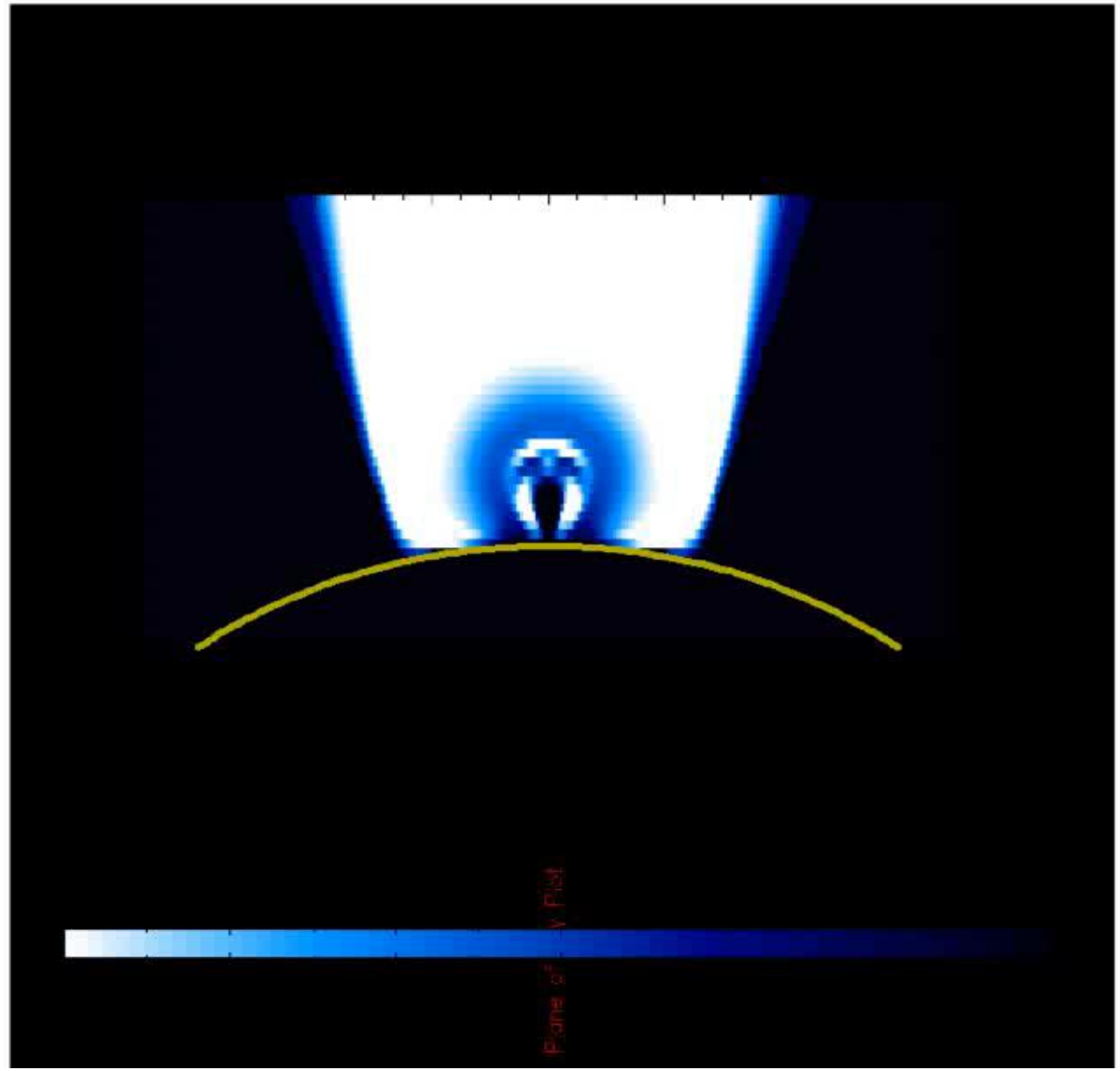
Plane of

Conclusions

- During slow activation phase boundary of the cavity has a hotter rim (T up to 4 MK)

- During eruption few MK plasma filled the cavity

- Our results are consistent with MHD model of Fan (2019)