

First Transient Survey with AARTFAAC

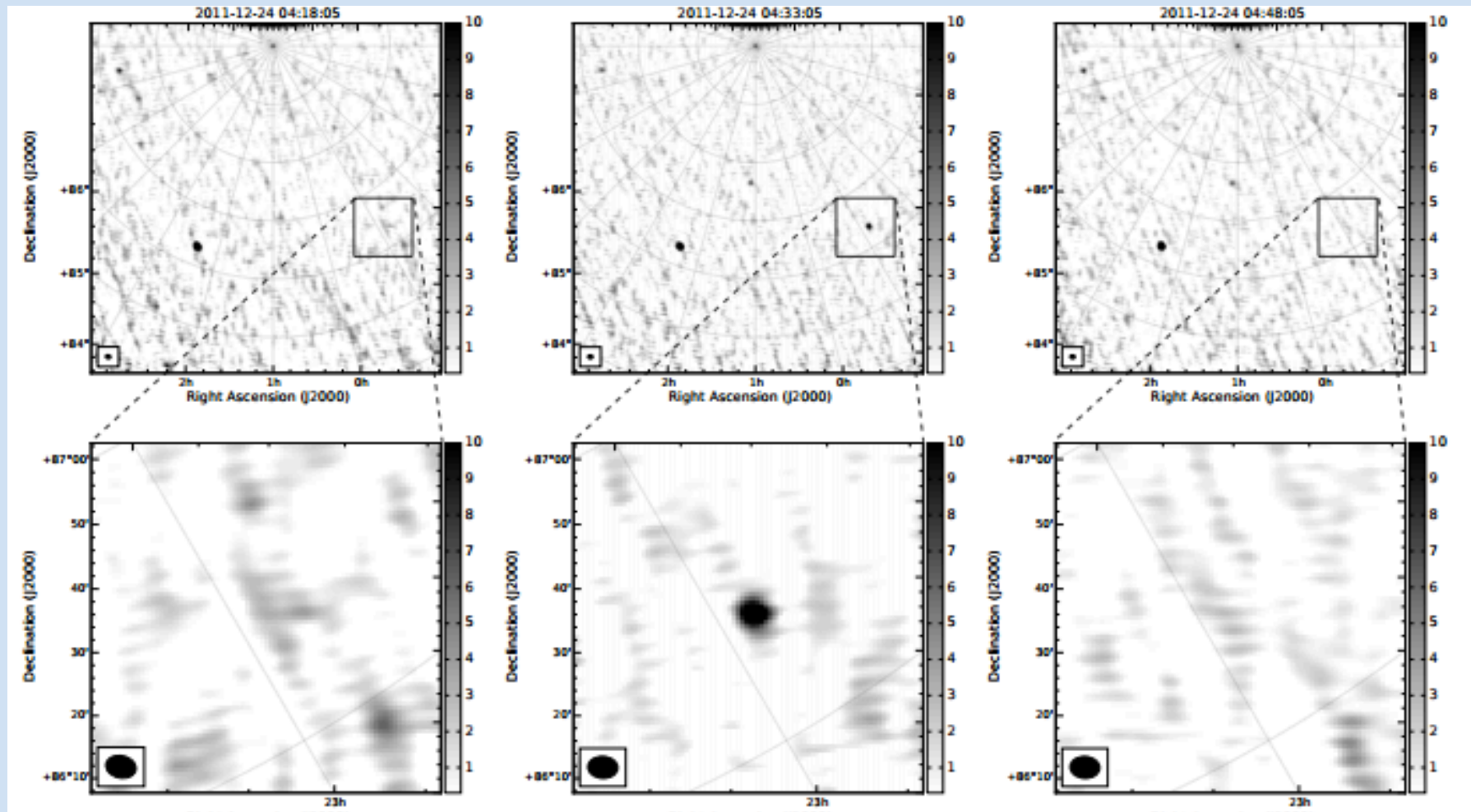
Yvette Cendes

LOFAR Science Meeting

April 6, 2016






Searching for Transients



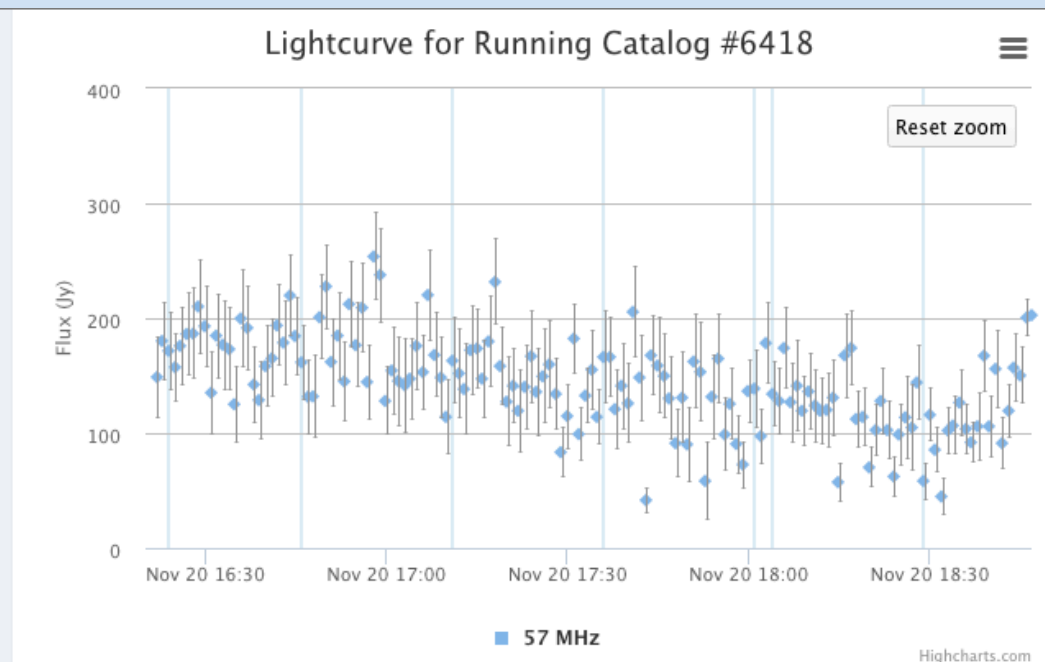
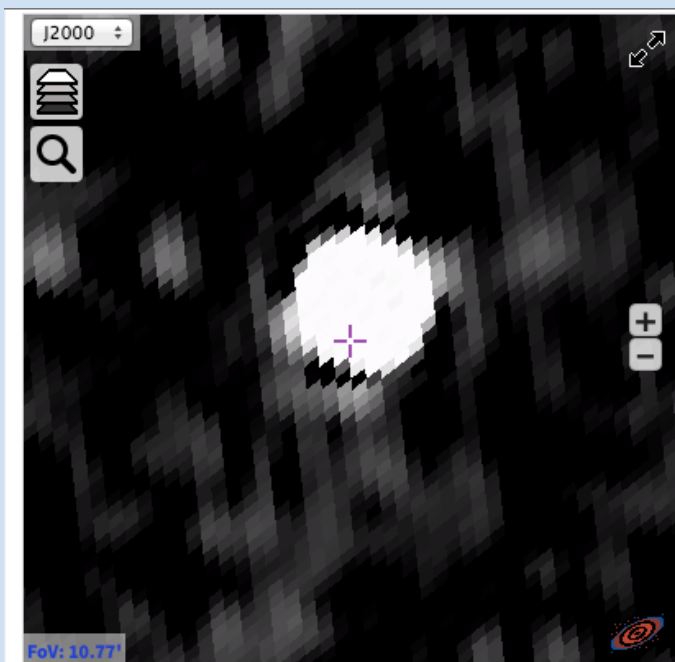
Source: Stewart et al 2015

Comparing the Instruments

	AARTFAAC	MWA	LWA1
			
Array Elements	288 inverted V antennas	128 tiles	256 wiregrid bowties
Freq. Range (MHz)	30-90	80-300	10-88
Field of View (sr)	π	0.06π	π
Angular Resolution (arcmin)	60	3	120
Spectral Res. (kHz)	15	40	75
Temporal Res. (s)	1	4	5
Sensitivity (Jy)	40	8.7	~80

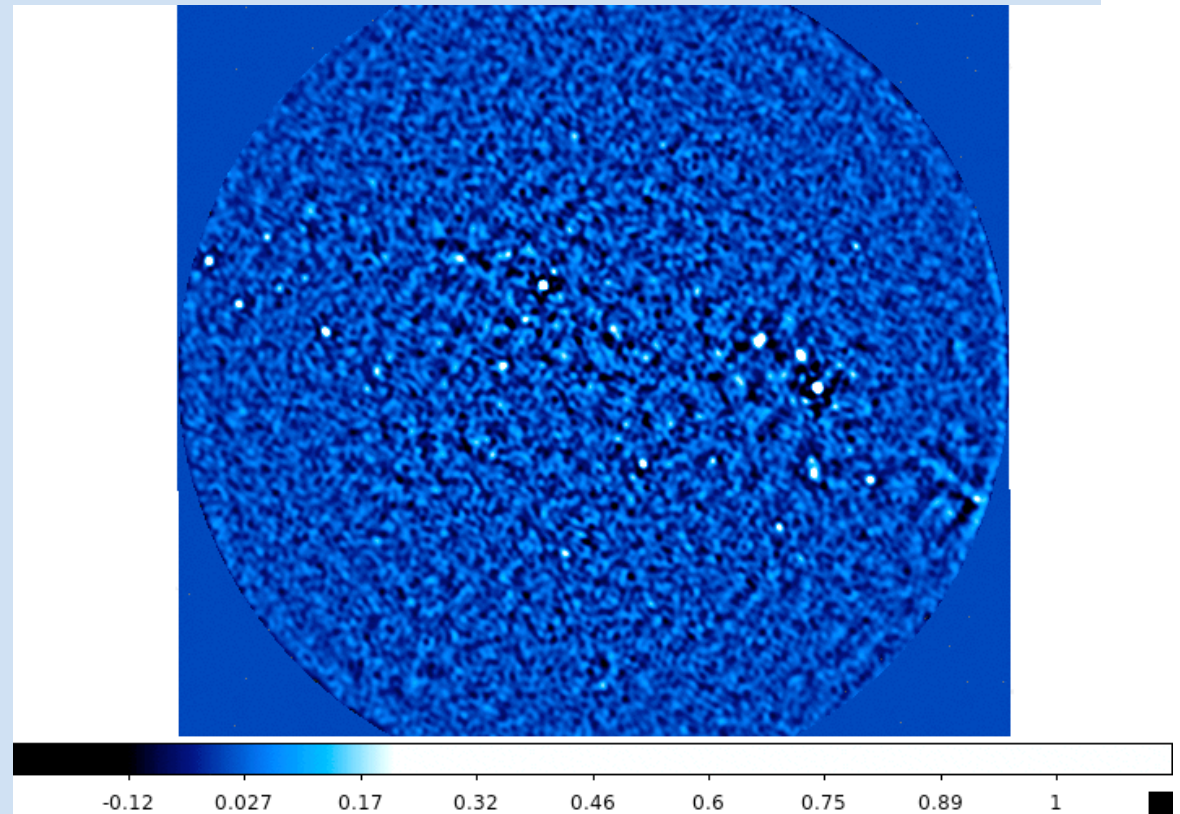
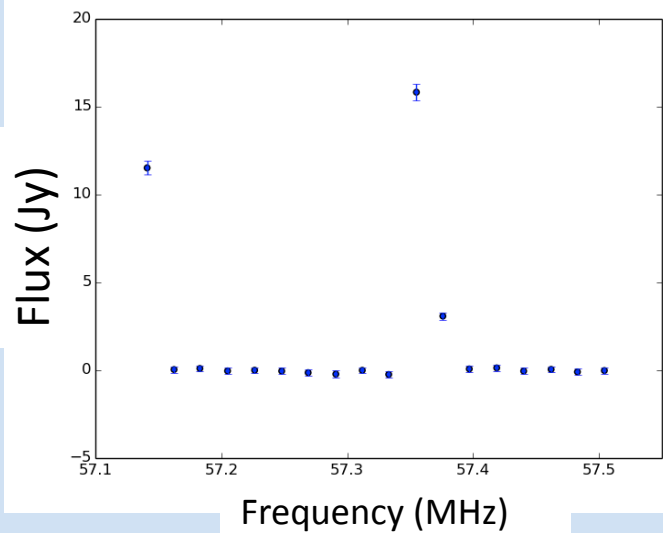
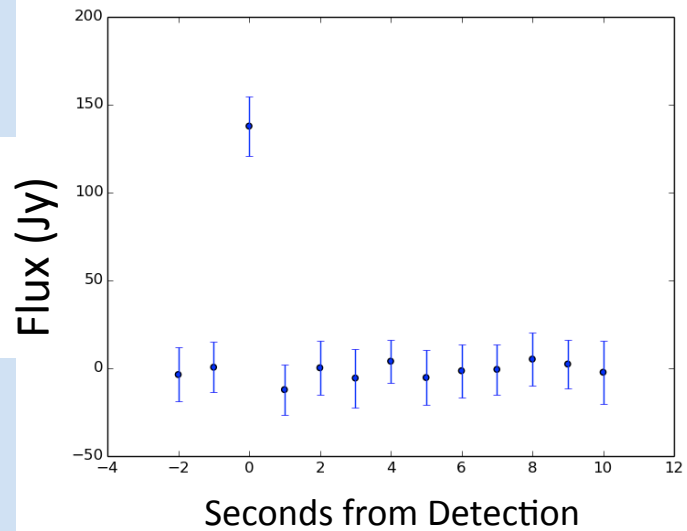
The First Transient Survey

- Two subbands of a RFI-free 4.5 hour data stretch @57MHz, 1 subband bandwidth, 1 second integration on images which are calibrated
- Typical flux uncertainty is ~ 30 Jy

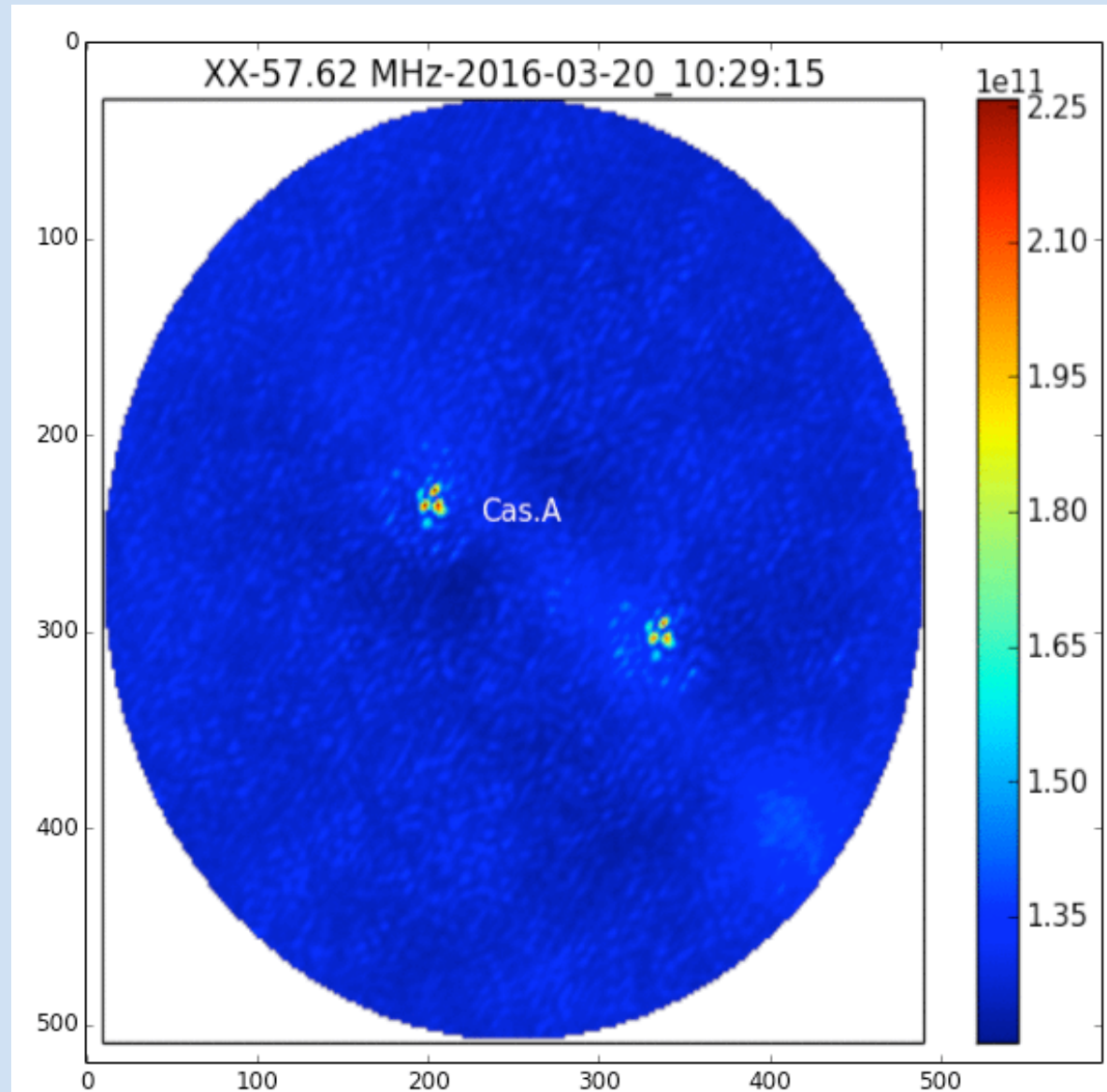


Meteor Scatter

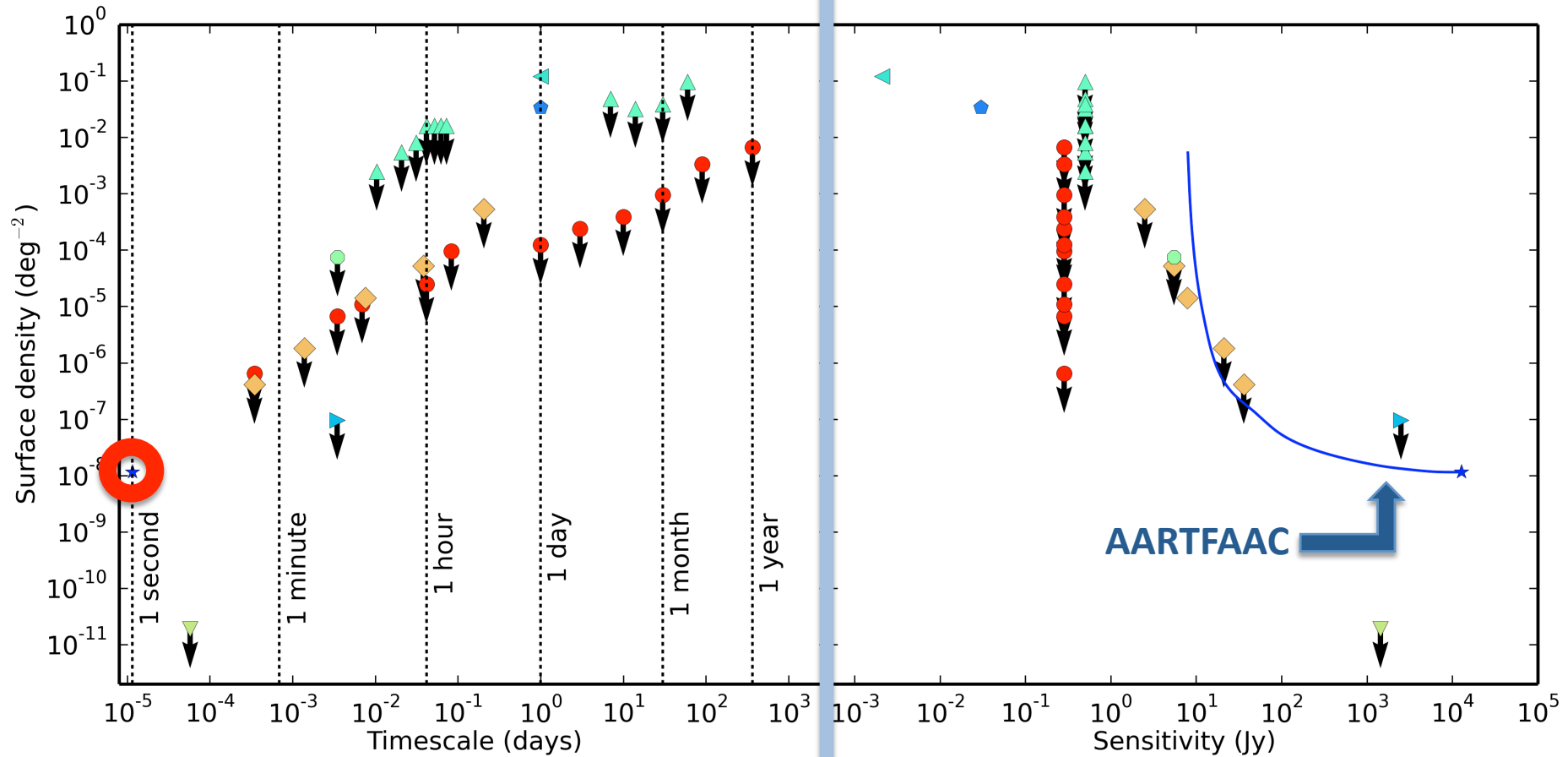
- Flashes in the sky detected by TraP



Solar Flares



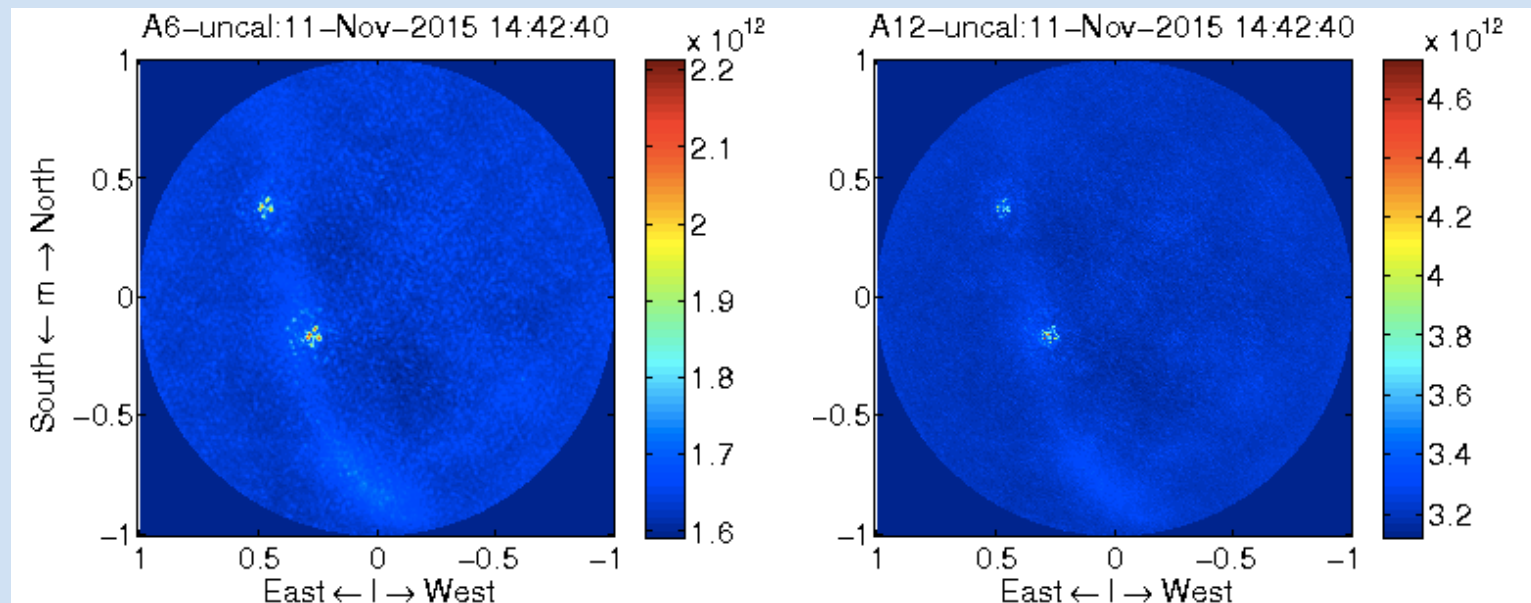
Transient Rate Results



- | | | | | |
|---------------------------|----------------------------|-------------------------|-----------------------|-----------------------|
| ● Rowlinson et al. (2016) | ▼ Obenberger et al. (2015) | ▲ Carbone et al. (2014) | ▶ Lazio et al. (2010) | ◆ Hyman et al. (2019) |
| ◆ Stewart et al. (2015) | ● Bell et al. (2014) | ◀ Jaeger et al. (2012) | | |

The Next Steps

- More hours of data
- Integration over different time scales
- More subbands and frequency integration
- AARTFAAC-12



Conclusions

- The AARTFAAC project is open for business, and we are soon releasing our first transient survey results!
- We will also begin integrating images over greater time, frequency scales to probe different domains for transients
- Hopefully real-time transient detection will be possible soon

