



Multi-wavelength Observations of a Metric Type II event

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and the ARTEMIS group

The ARTEMIS group

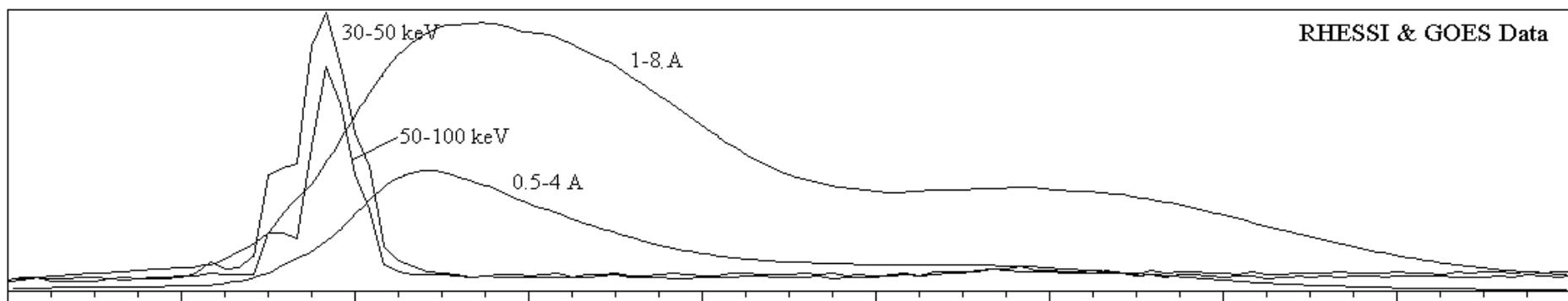
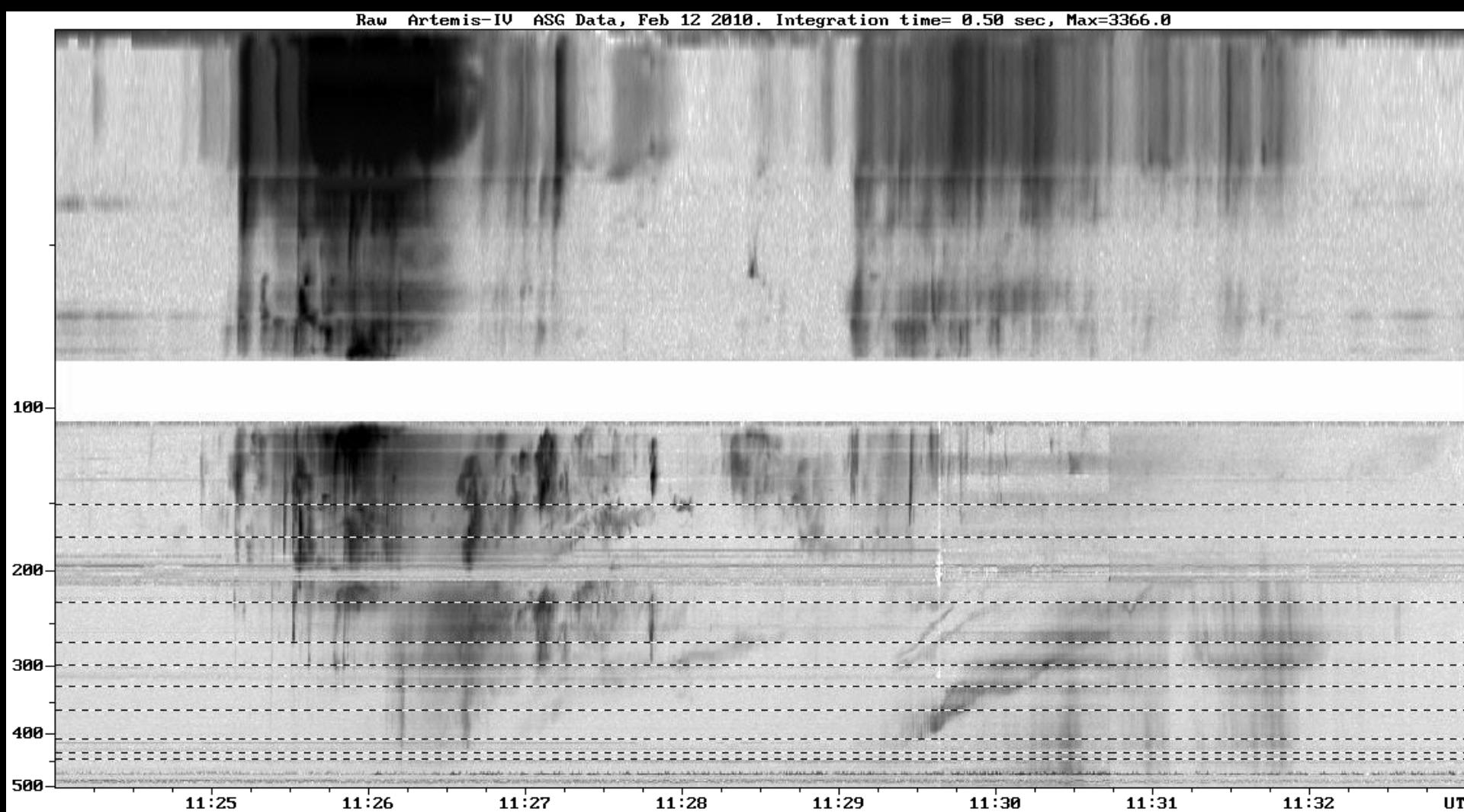
C. Caroubalos, J-L Bougeret, G. Dumas

G. Preka-Papadema, X. Moussas

T. Kontogeorgos, P. Tsitsipis

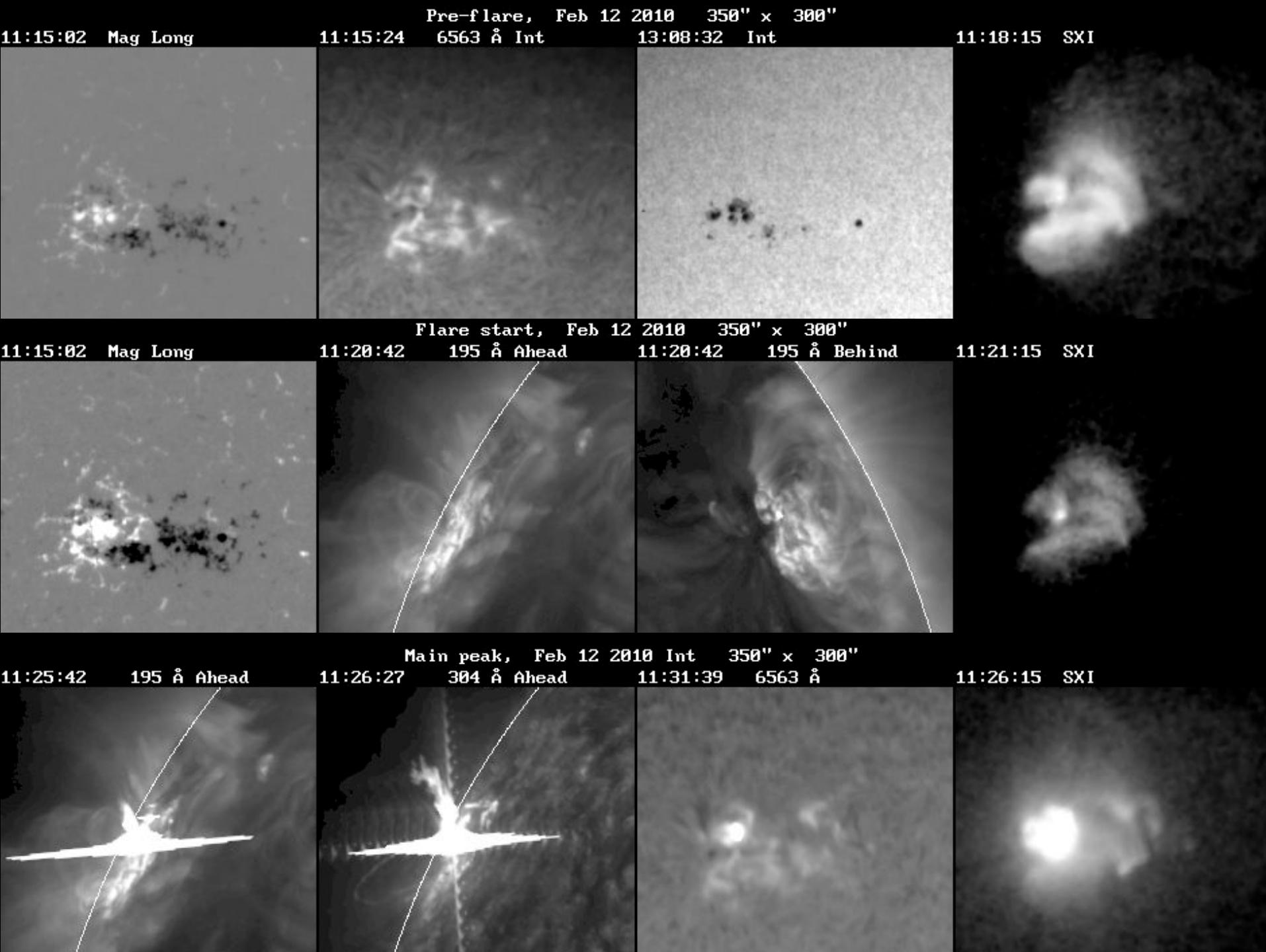
Others, depending on the occasion

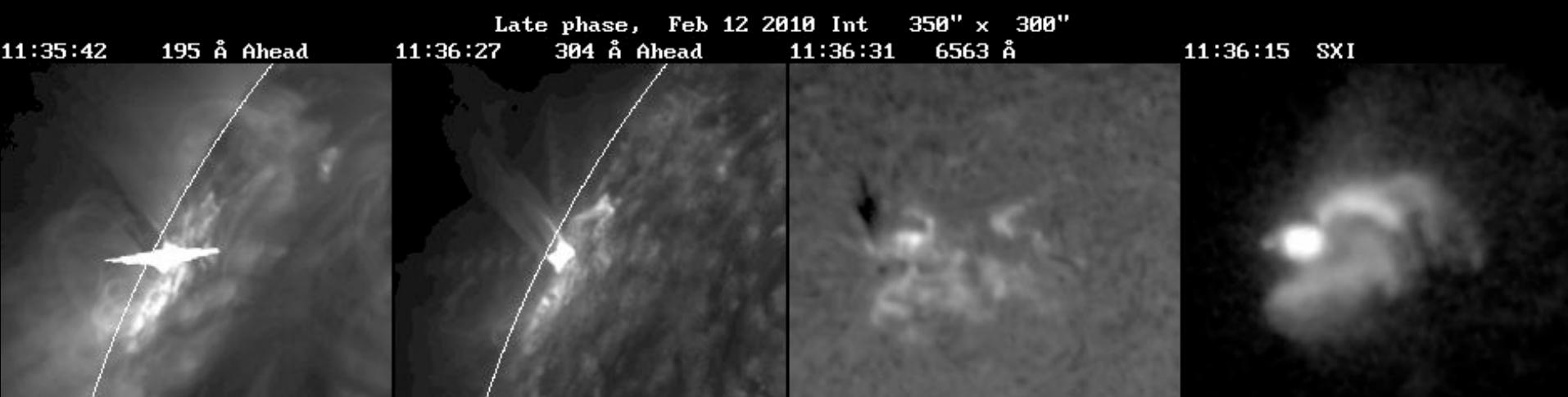
Raw Artemis-IV ASG Data, Feb 12 2010. Integration time= 0.50 sec, Max=3366.0



Other Data

- Nançay Radioheliograph
- H-alpha (Catania)
- Magnetograms
- STEREO – SECCHI, A & B (195 & 304 Å)
- STEREO Coronographs, A & B
- GOES (SXI) images
- No SOHO data
- Hinode & TRACE pointed elsewhere





CME Images, STEREO A; Feb 12 2010 Int 1518" x 2160"

11:35:42

195 Å

11:36:27 304 Å

11:35:21

11:35:21



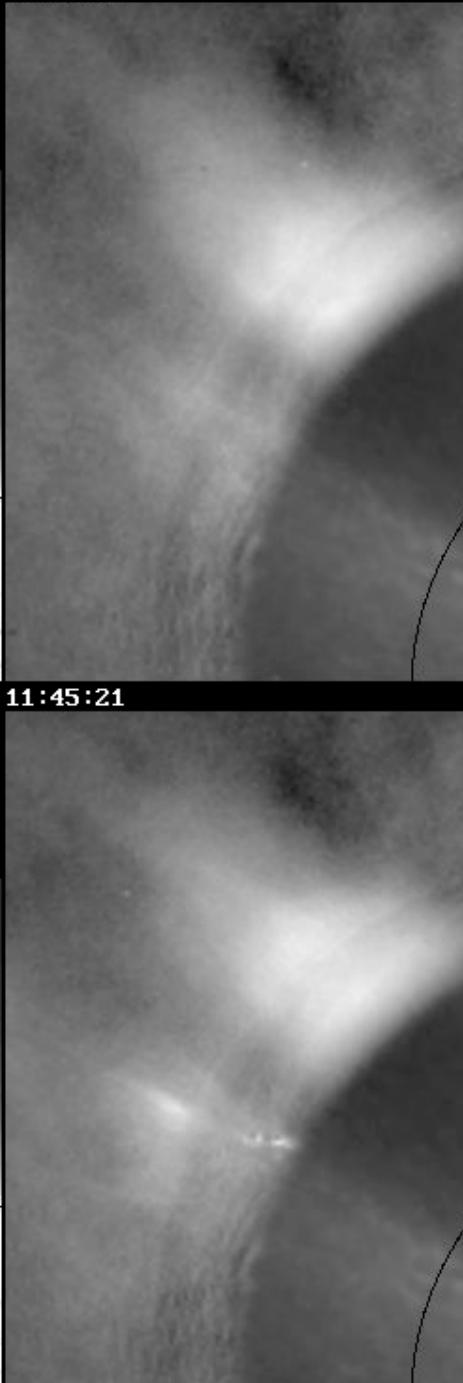
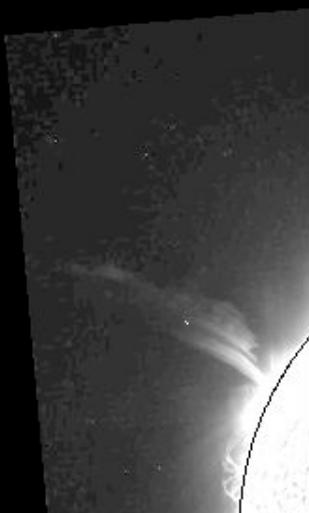
11:45:42

195 Å

11:46:27 304 Å

11:45:21

11:45:21



Anything else?



11:35:42

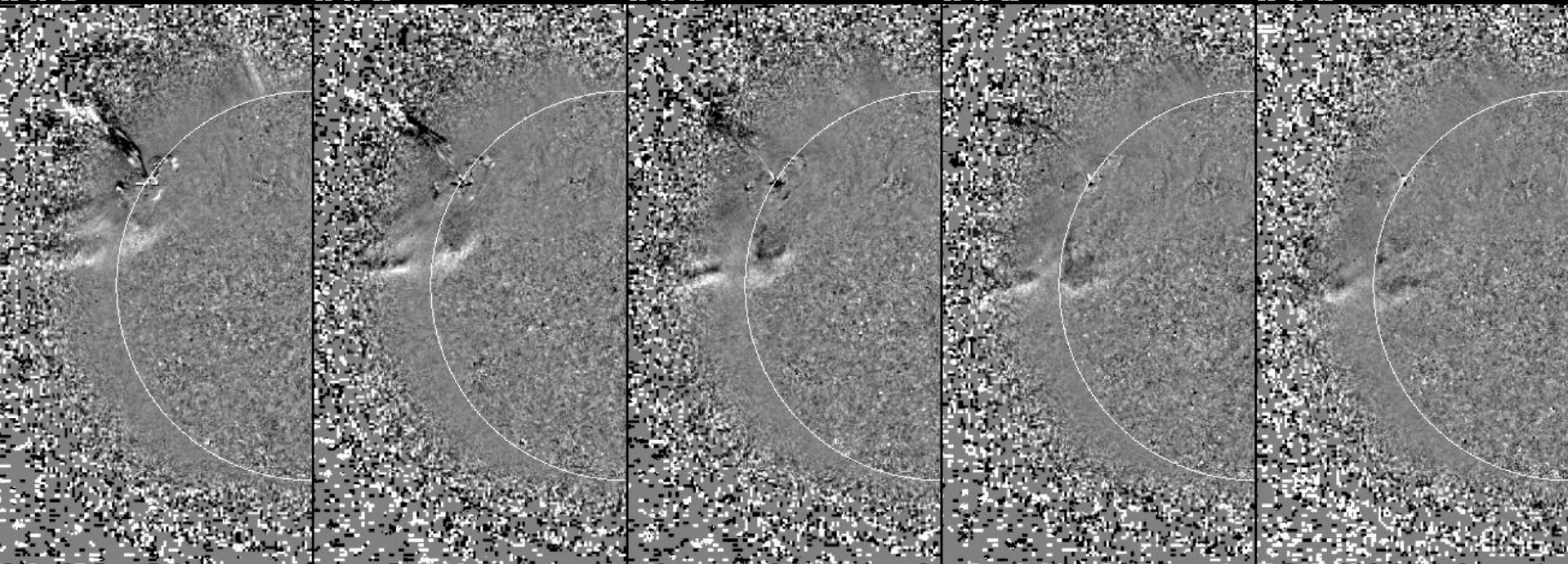
STEREO A, difference images Feb 12 2010 195 Å Int 1550" x 2800"

11:38:12

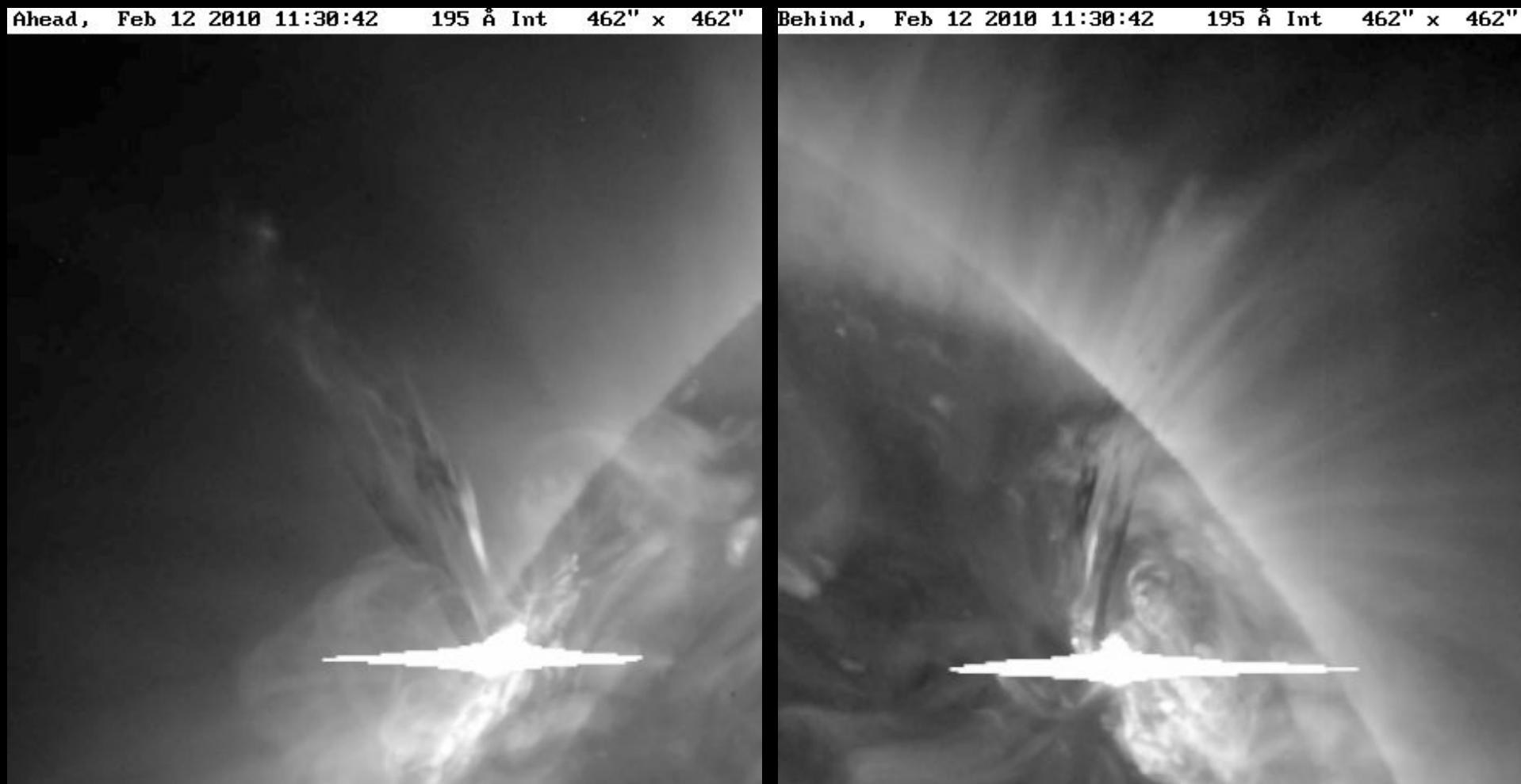
11:48:42

11:43:12

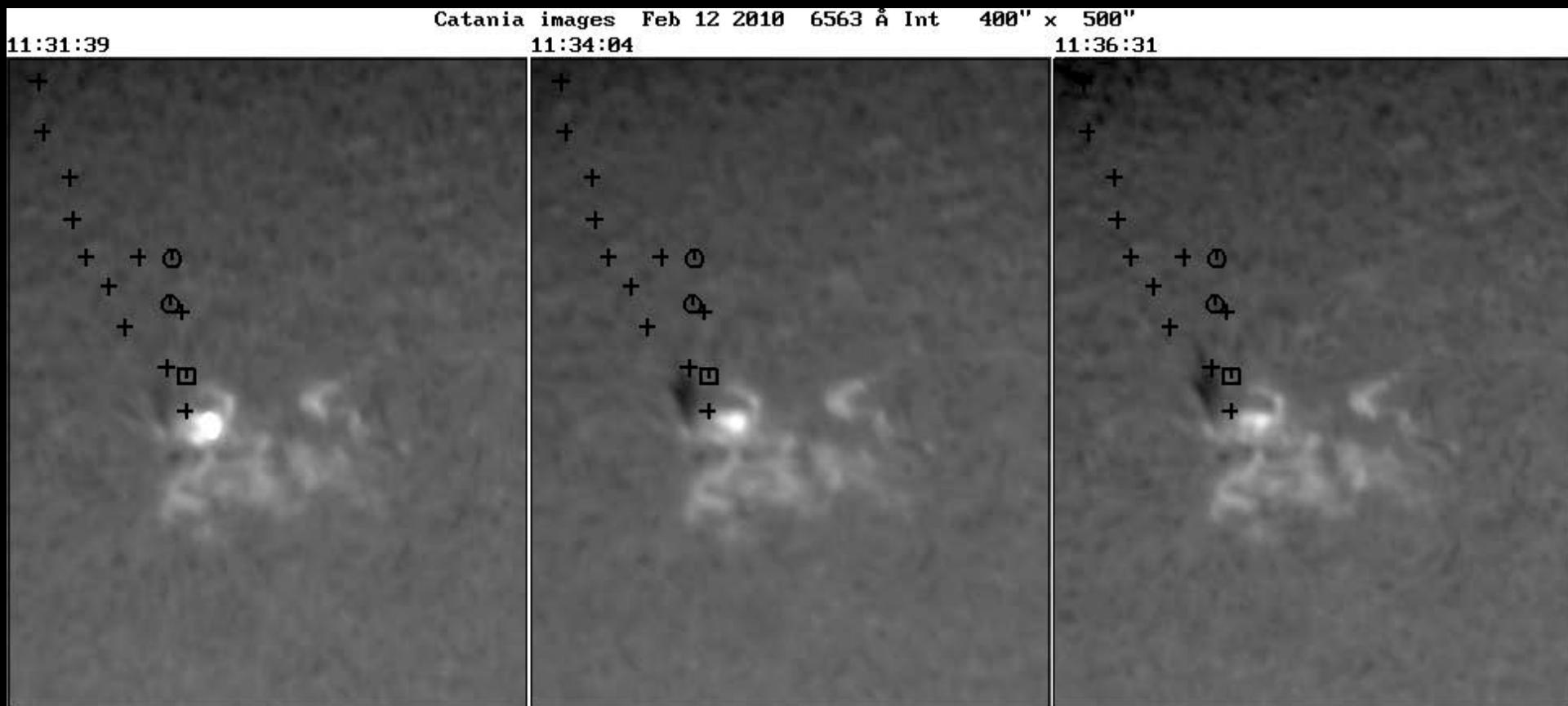
11:45:42



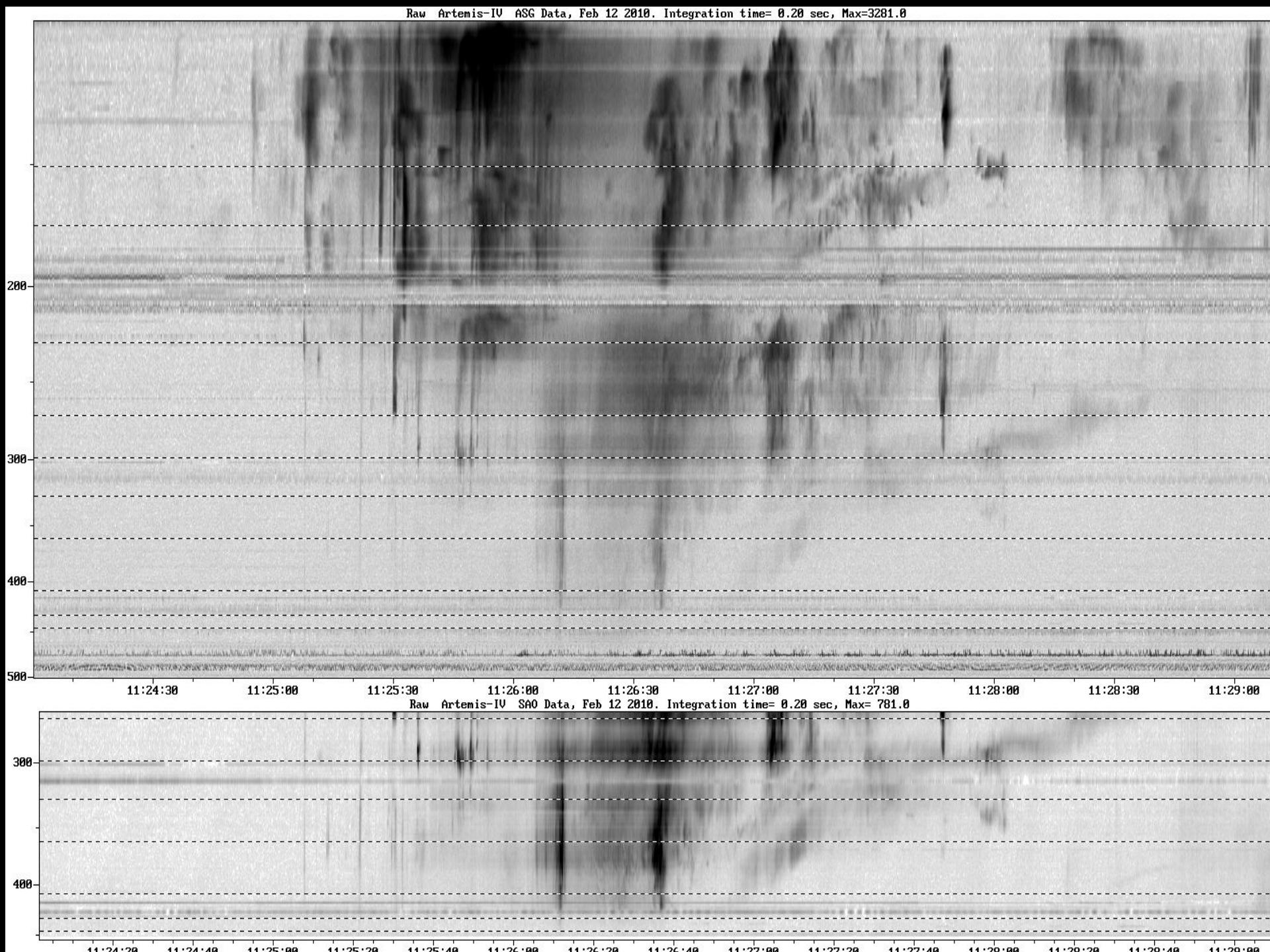
Triangulation, 195Å, 11:30:42 UT



Ejecta positions projected on H α images

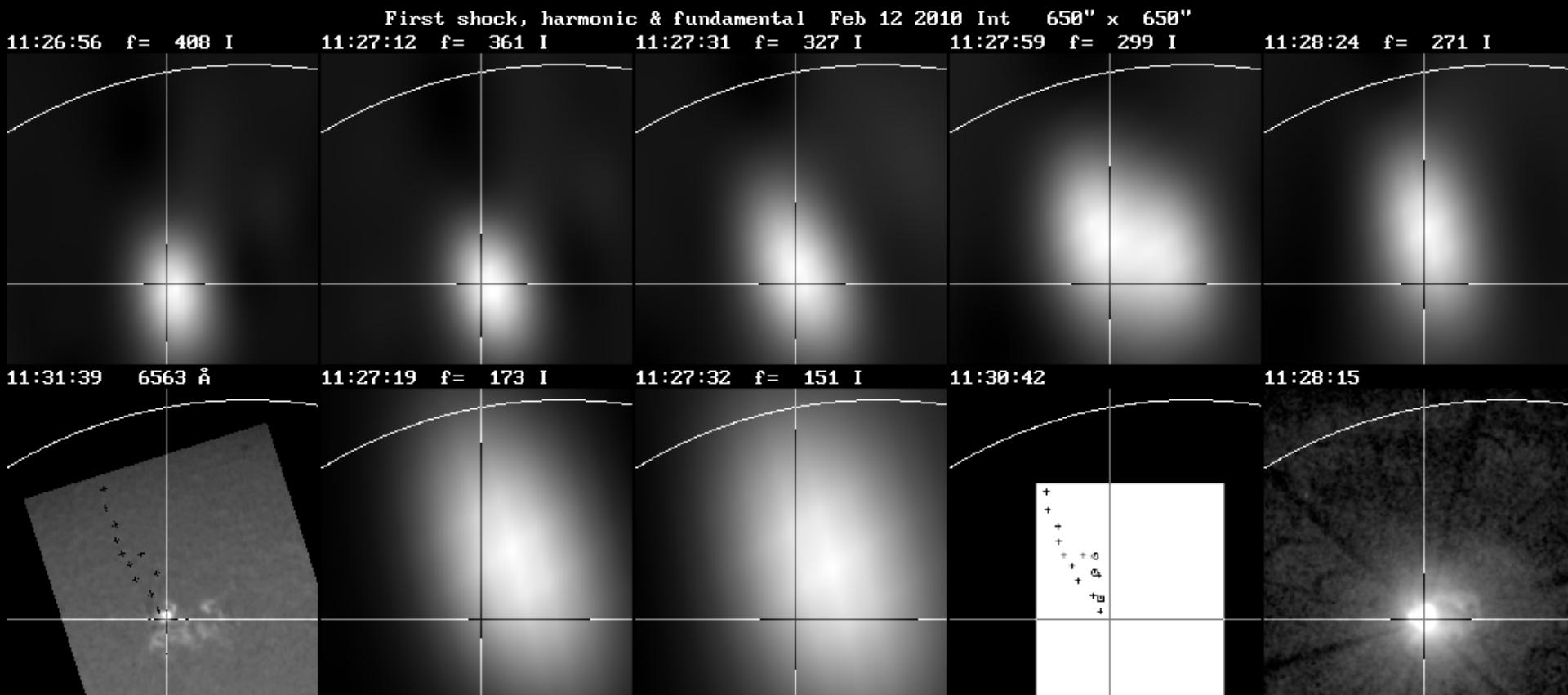


Raw Artemis-IV ASG Data, Feb 12 2010. Integration time= 0.20 sec, Max=3281.0

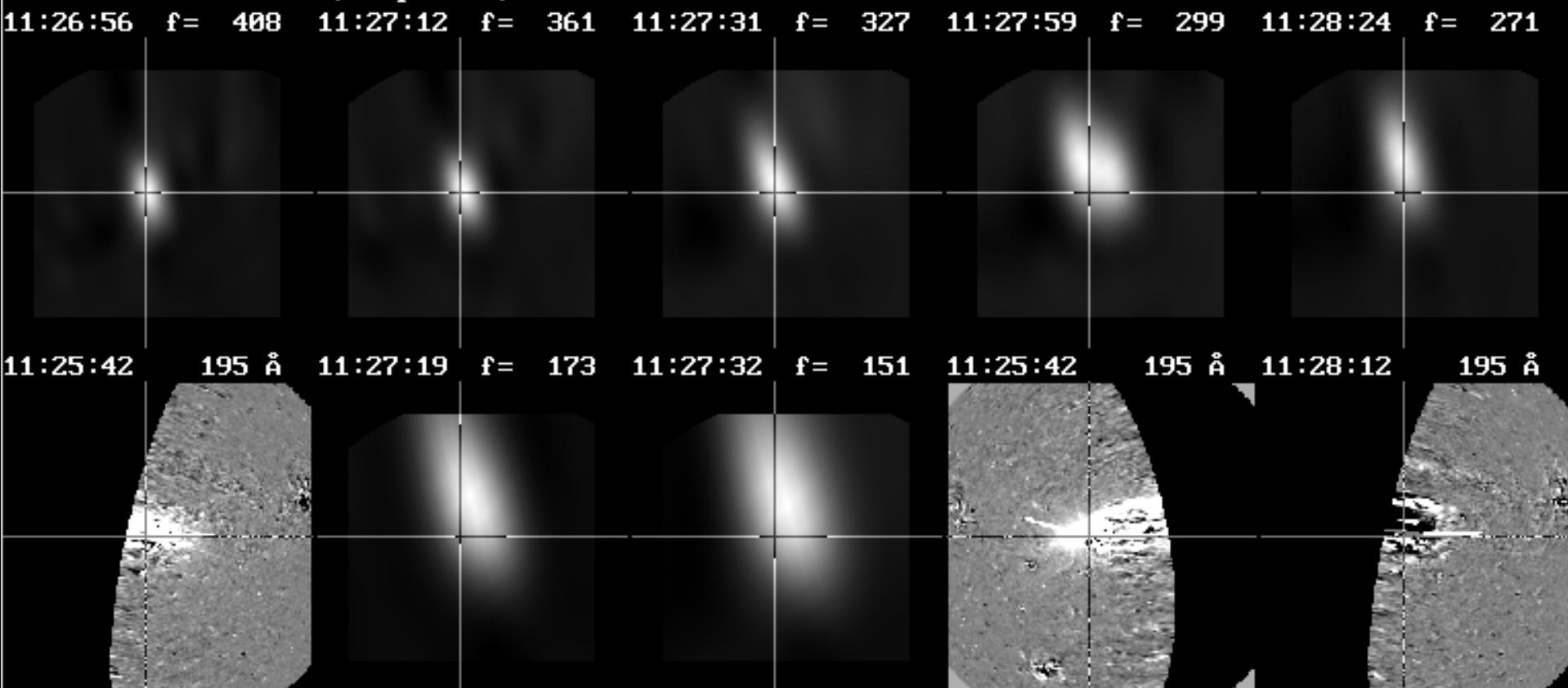


Raw Artemis-IV SAO Data, Feb 12 2010. Integration time= 0.20 sec, Max= 781.0

Position of first Type II (Nançay RH)

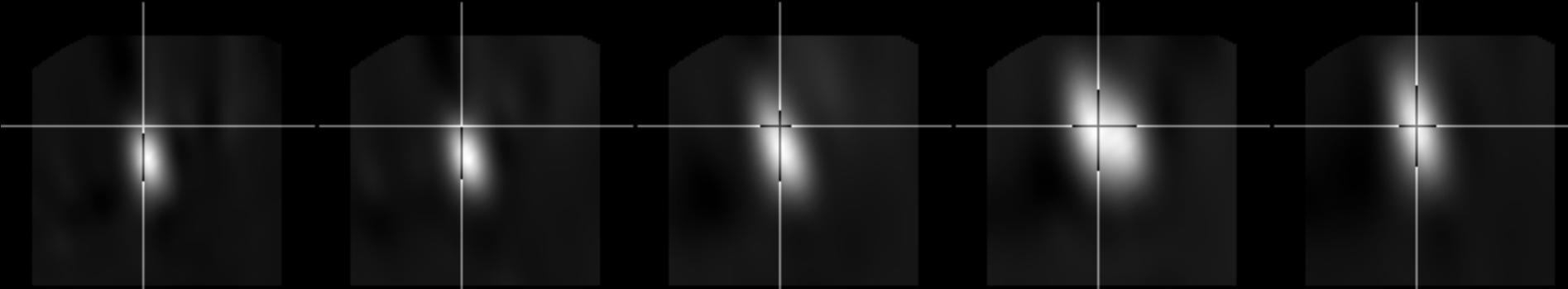


First shock, top view, harmonic & fundamental Feb 12 2010 Int 1500" x 1500"

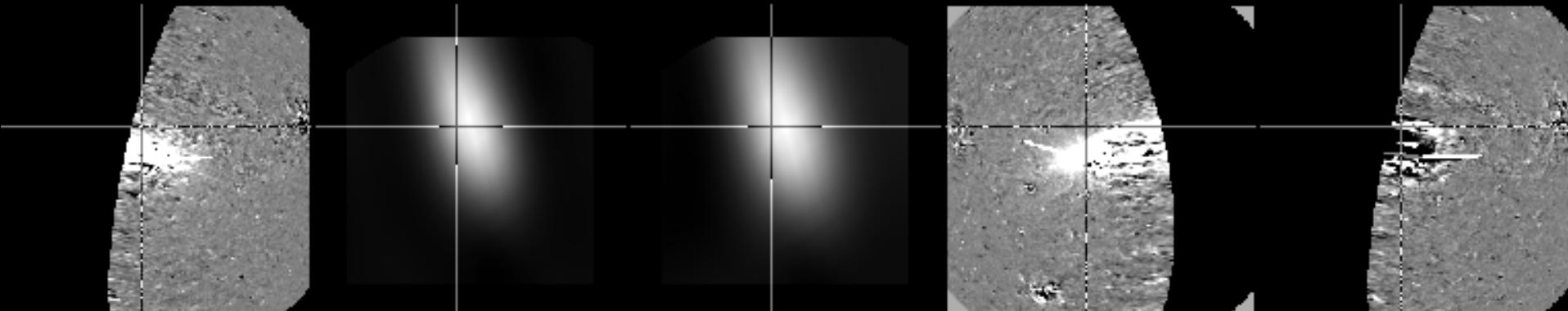


First shock, top view, harmonic & fundamental Feb 12 2010 Int 1500" x 1500"

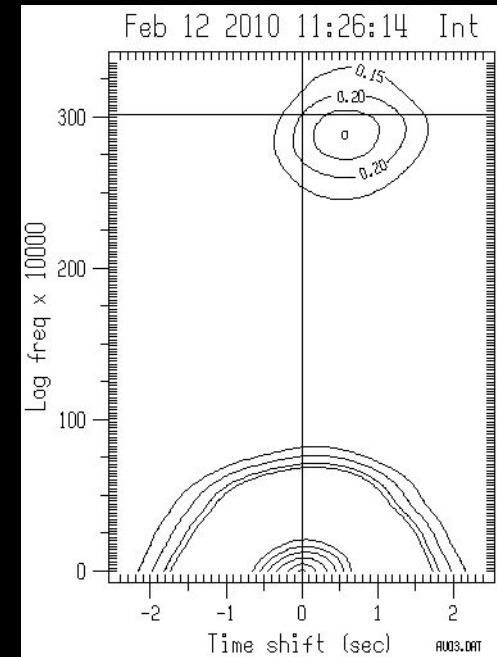
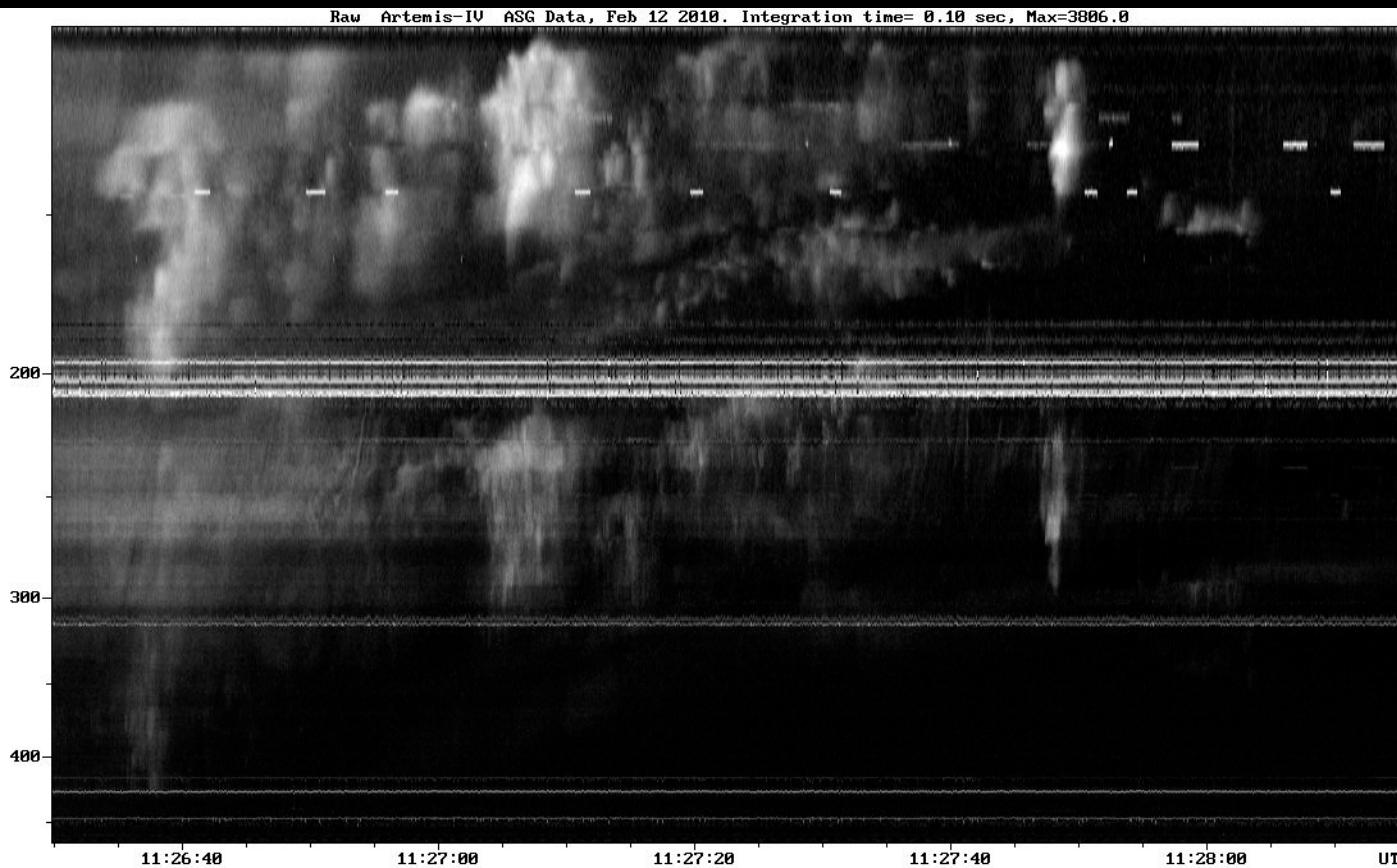
11:26:56 f= 408 11:27:12 f= 361 11:27:31 f= 327 11:27:59 f= 299 11:28:24 f= 271



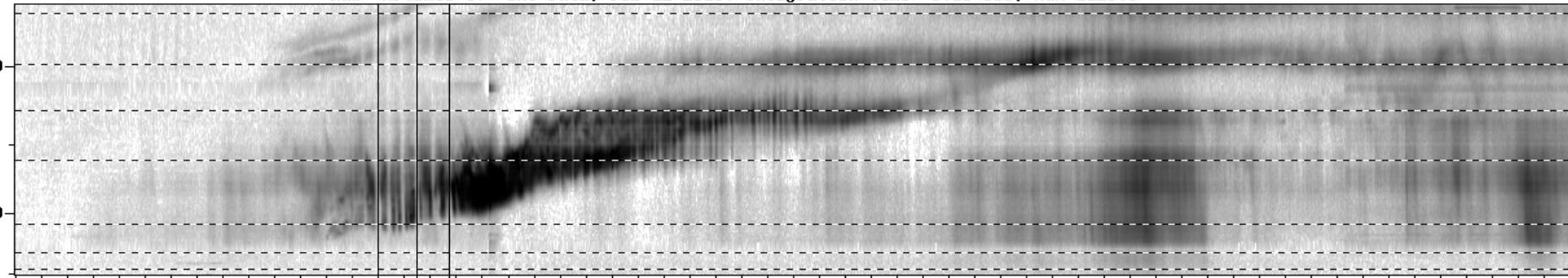
11:25:42 195 Å 11:27:19 f= 173 11:27:32 f= 151 11:25:42 195 Å 11:28:12 195 Å



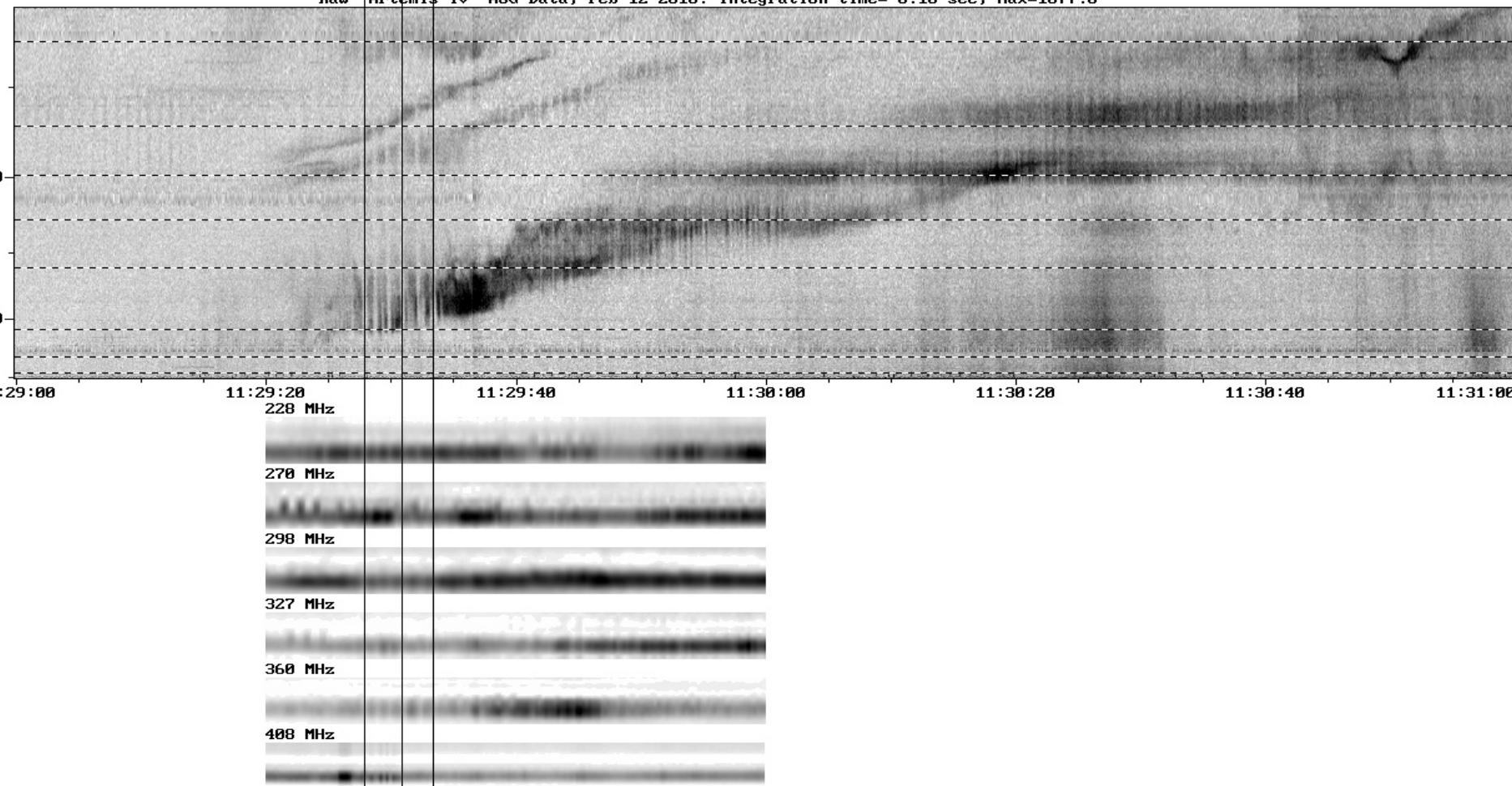
Emission at the fundamental & at the harmonic



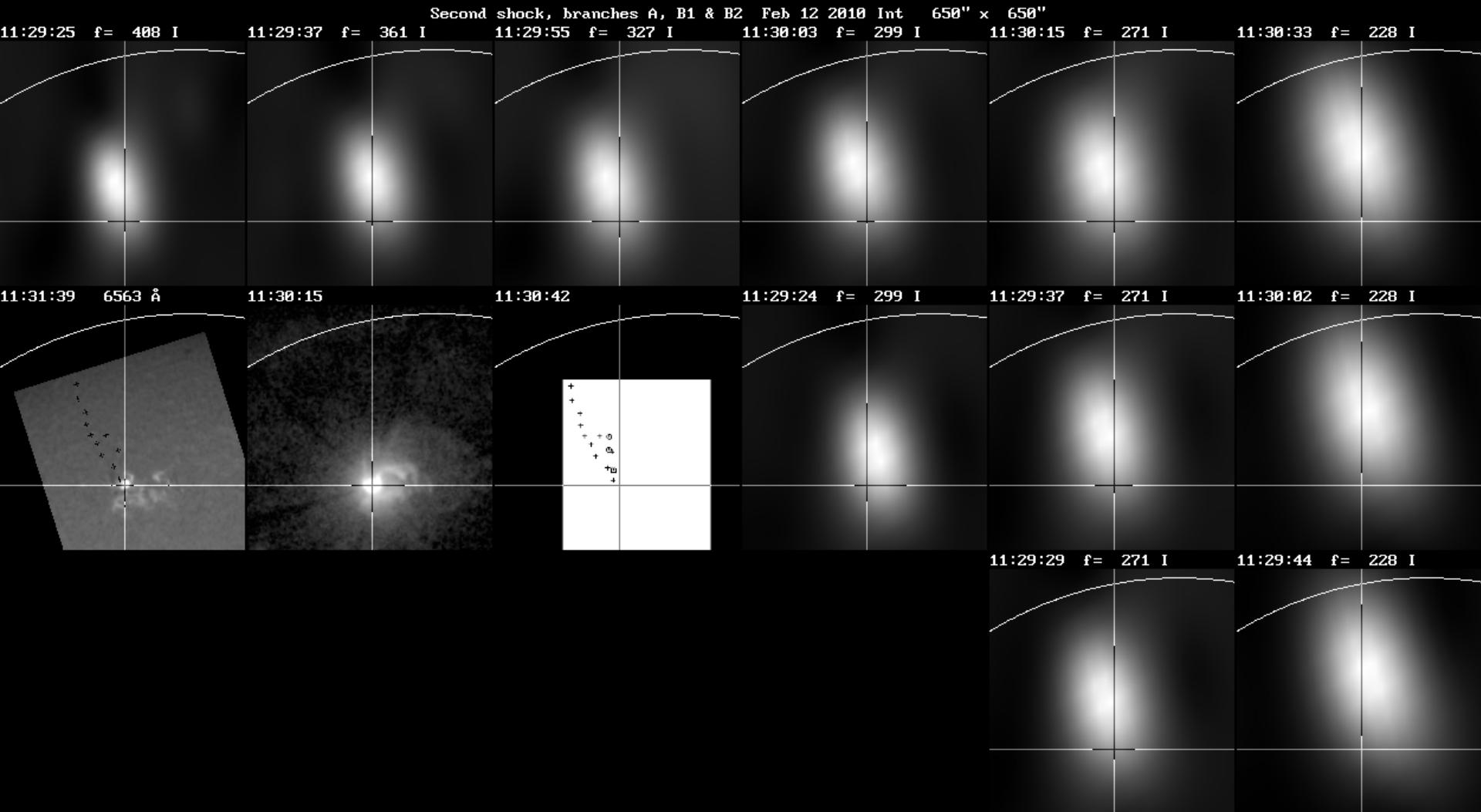
Raw Artemis-IV SAO Data, Feb 12 2010. Integration time= 0.10 sec, Max=1129.0



Raw Artemis-IV ASG Data, Feb 12 2010. Integration time= 0.10 sec, Max=1077.0

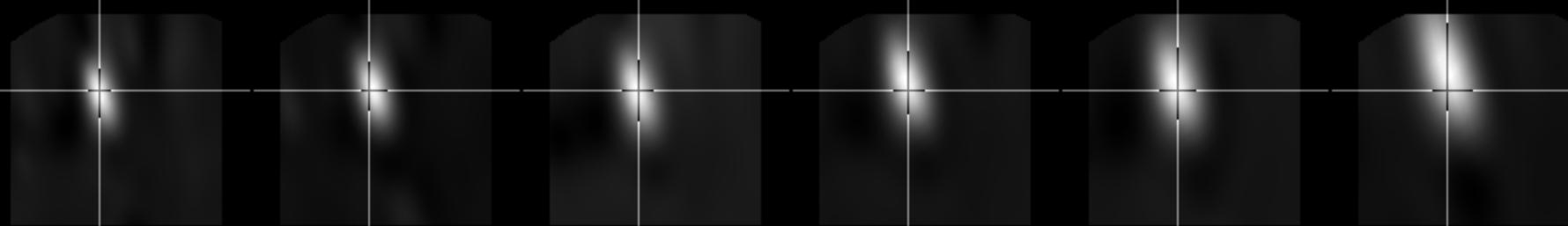


Position of second Type II (Nançay RH)

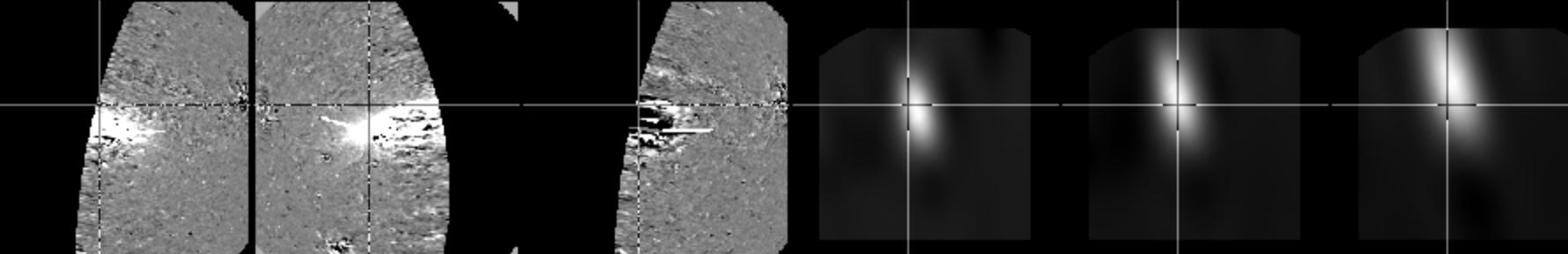


Second shock, top view, branches A, B1 & B2 Feb 12 2010 Int 1500" x 1500"

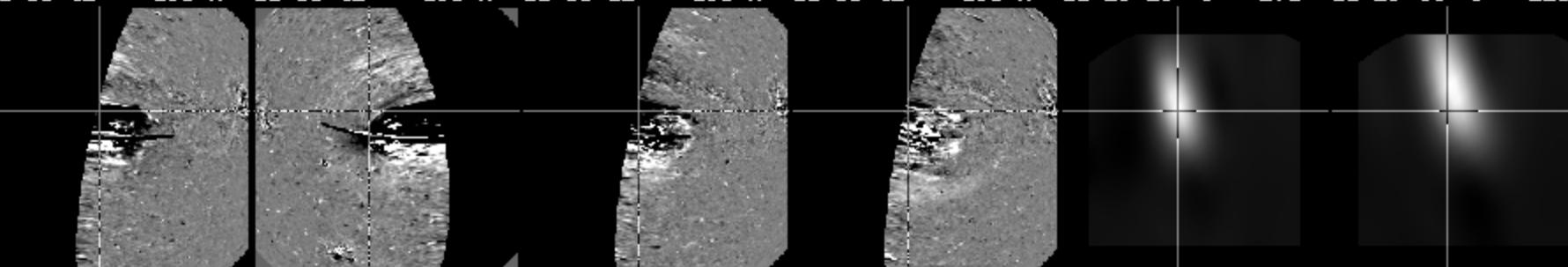
11:29:25 f= 408 11:29:37 f= 361 11:29:55 f= 327 11:30:03 f= 299 11:30:15 f= 271 11:30:33 f= 228



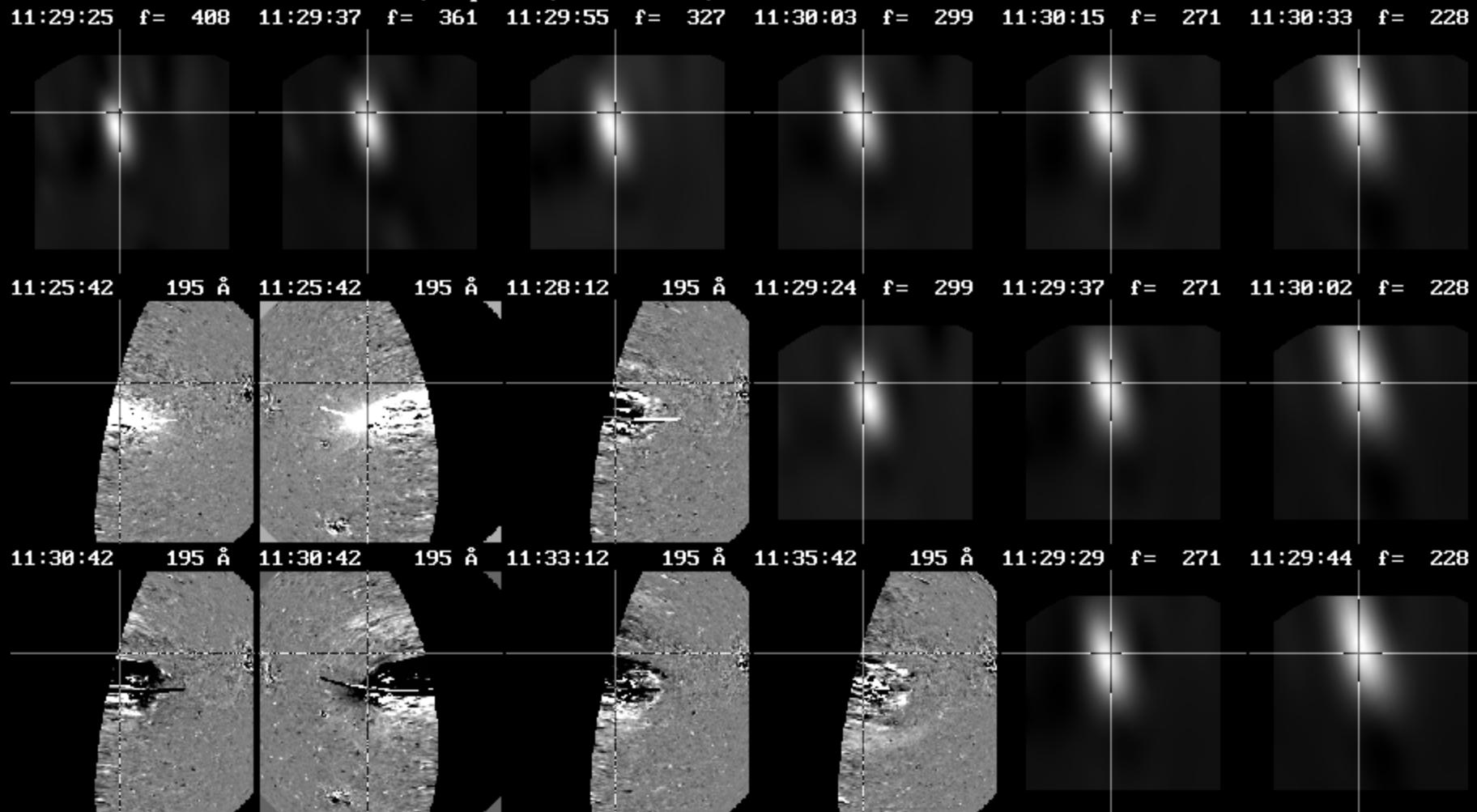
11:25:42 195 Å 11:25:42 195 Å 11:28:12 195 Å 11:29:24 f= 299 11:29:37 f= 271 11:30:02 f= 228



11:30:42 195 Å 11:30:42 195 Å 11:33:12 195 Å 11:35:42 195 Å 11:29:29 f= 271 11:29:44 f= 228



Second shock, top view, branches A, B1 & B2 Feb 12 2010 Int 1500" x 1500"



Conclusions (so far)

- Two type II's (shocks), one for each phase of the flare
- Ejection and “bubble” during the event
- First shock probably associated with the ejection
- Second shock probably associated with “bubble”
- F/H structure, freq ratio ~ 1.95 , delay ~ 0.5 s
- “Pulsating” emission, extending over the second type II and the continuum (> 200 MHz bandwidth)

