HBA-TBB images

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LOFAR STATUS MEETING 25-11

Special thanks to
Sander ter Veen
Clancy James
Jan-David Mol

TBB data of HBA tiles

- Triggered data of 28-10, tile beam pointing to Crab Nebula
  - See Sander's talk last week

Goal: investigate short time (pulse) noise in beamformed data (NuMoon Trigger)

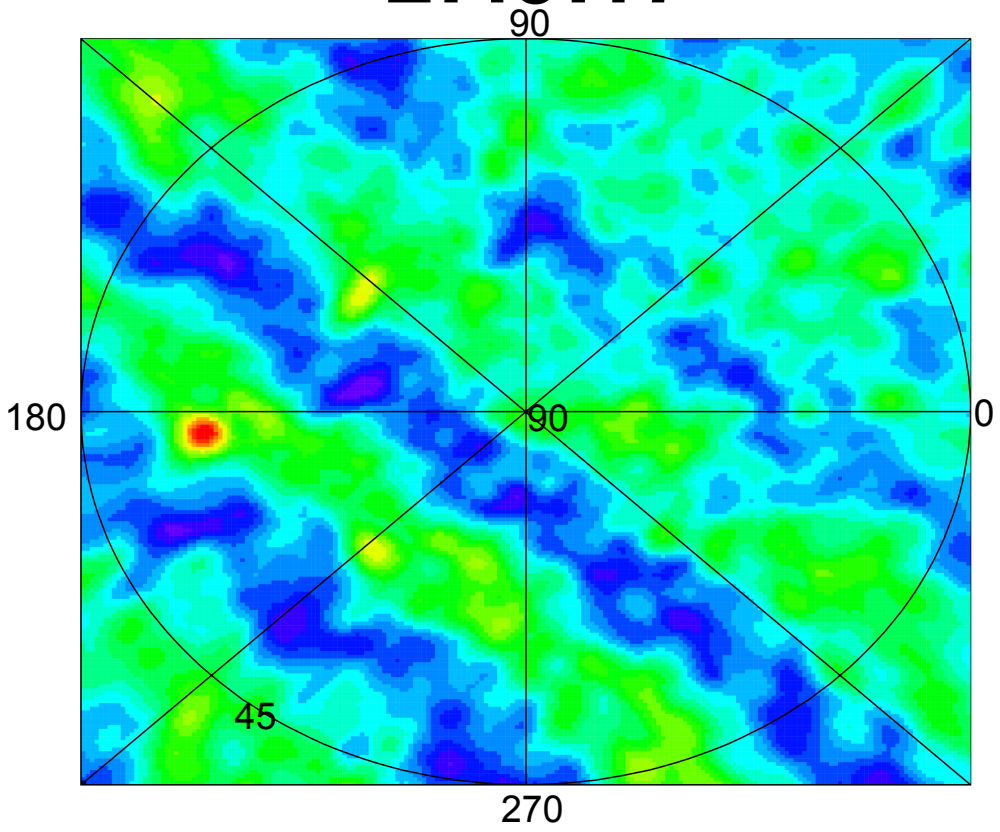
- First: Check beamforming
- Process ~5 ms of CS302 data for two different times:
  - Apply PolyPhase Filter to convert to freq
  - Select 4 channels (each 195 kHz wide)
    - **122.5, 142.0, 161.5, 181.0 Mhz**
  - Coherently add for 201x201 directions

Half station (1 “ear”)

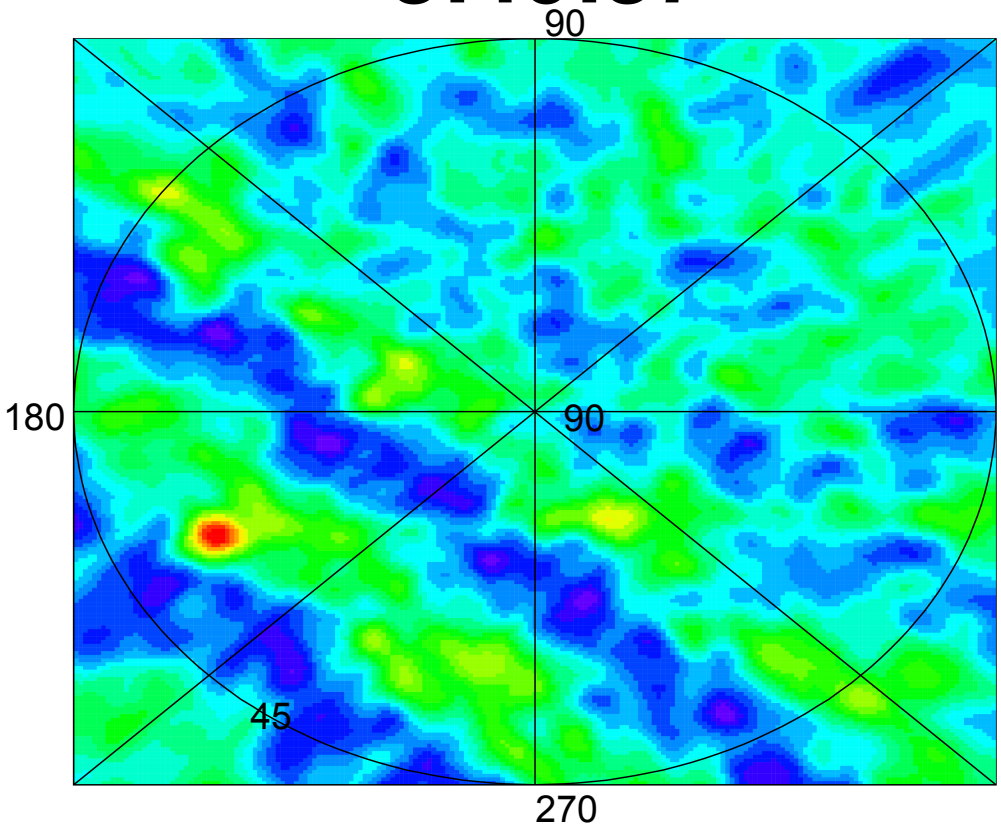
5ms only

Positions as expected

2:49:17



3:40:37

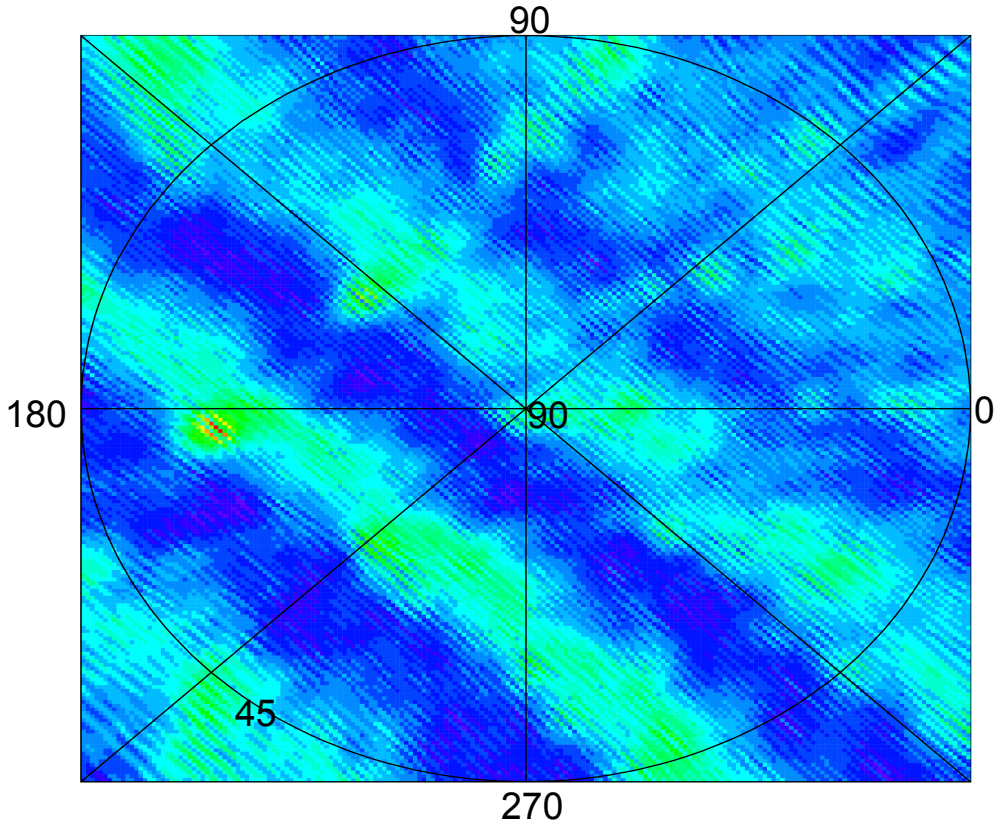


Full station (2 “ears”)

5ms only

Positions as expected

2:49:17



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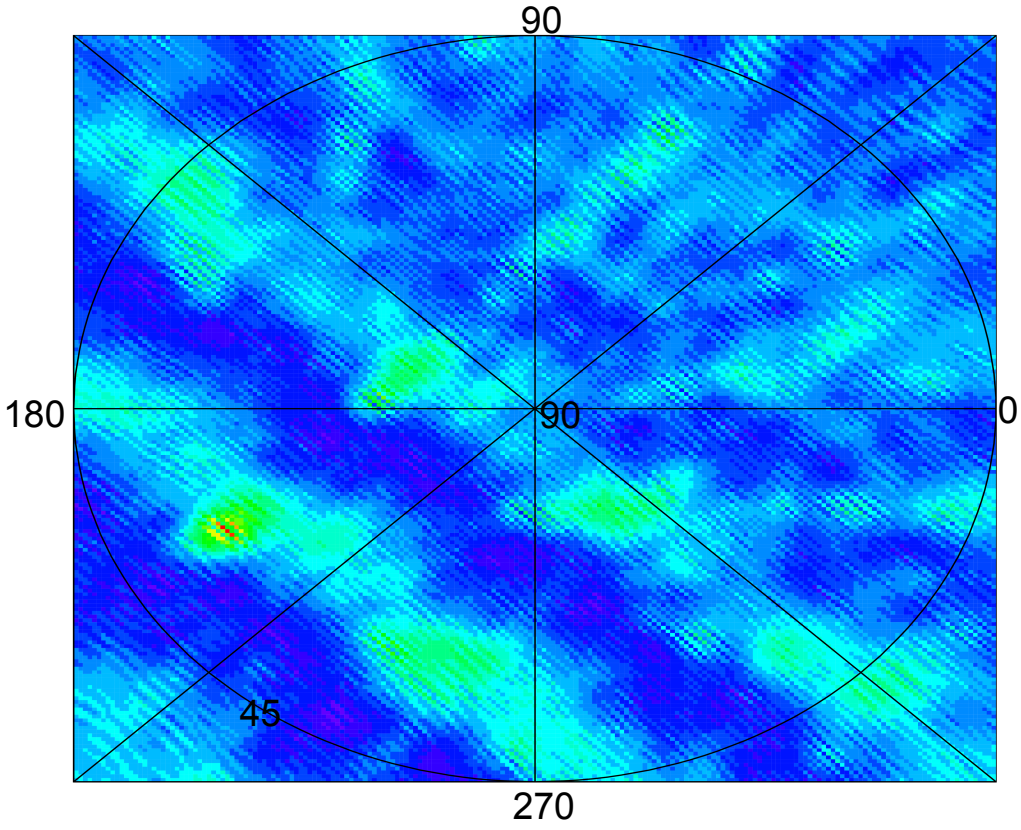
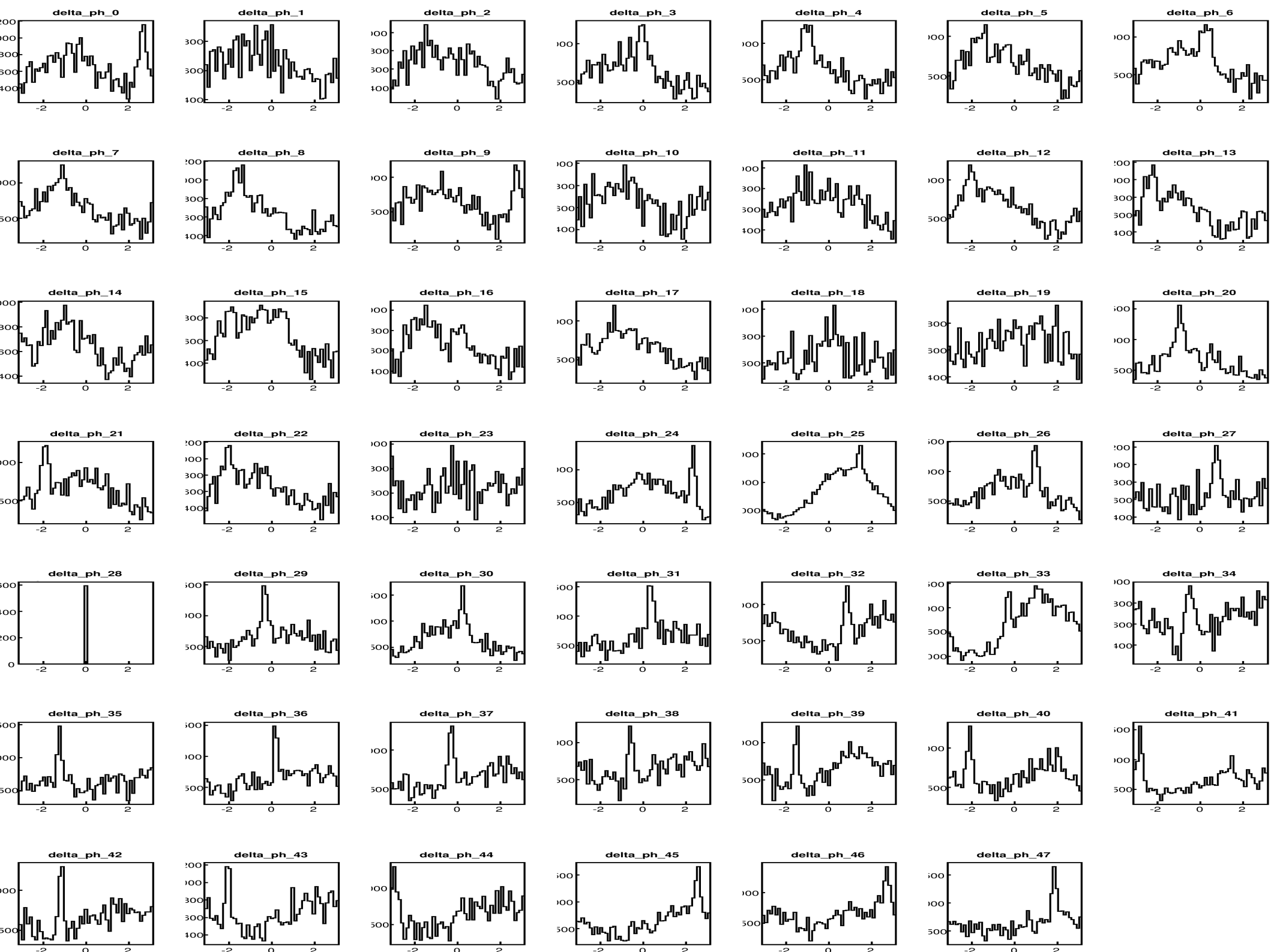


Phase errors

- For every tile
- relative phase in direction of Crab
  - ~10ms of data
  - for each timeframe
  - every channel

- Narrow peaks on top of background


delta_ph_0
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delta_ph_46
delta_ph_47

Conclusion and outlook

- 5ms images of Crab Nebula with HBA TBB data
- Next:
  - Correct for constant phase errors
  - Convert back to the time domain
  - Investigate pulse noise
    - As function of direction
- Longer time of data taking needed to investigate the noise to the desired level
  - Implement minimal trigger to select these data ??