Summary

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Overview

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- If we have N stations, we form N $\times$ (N$-$1)/2 baselines
- Instead of making a direct image of the sky, an interferometer simply fills the *uv* plane.
- Apply **Inverse Fourier Transform** to get a representation of the sky.

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- **listobs** - Summary of the measurement set
- **flagdata** - Flag bad data
- **plotants** - Plot the antenna locations.
- **plotms** - Plot the data in various ways.

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Calibration

Calibration

- Delay calibration
- Time-dependent phase calibration
- Bandpass calibration
- Elevation dependent gain calibration

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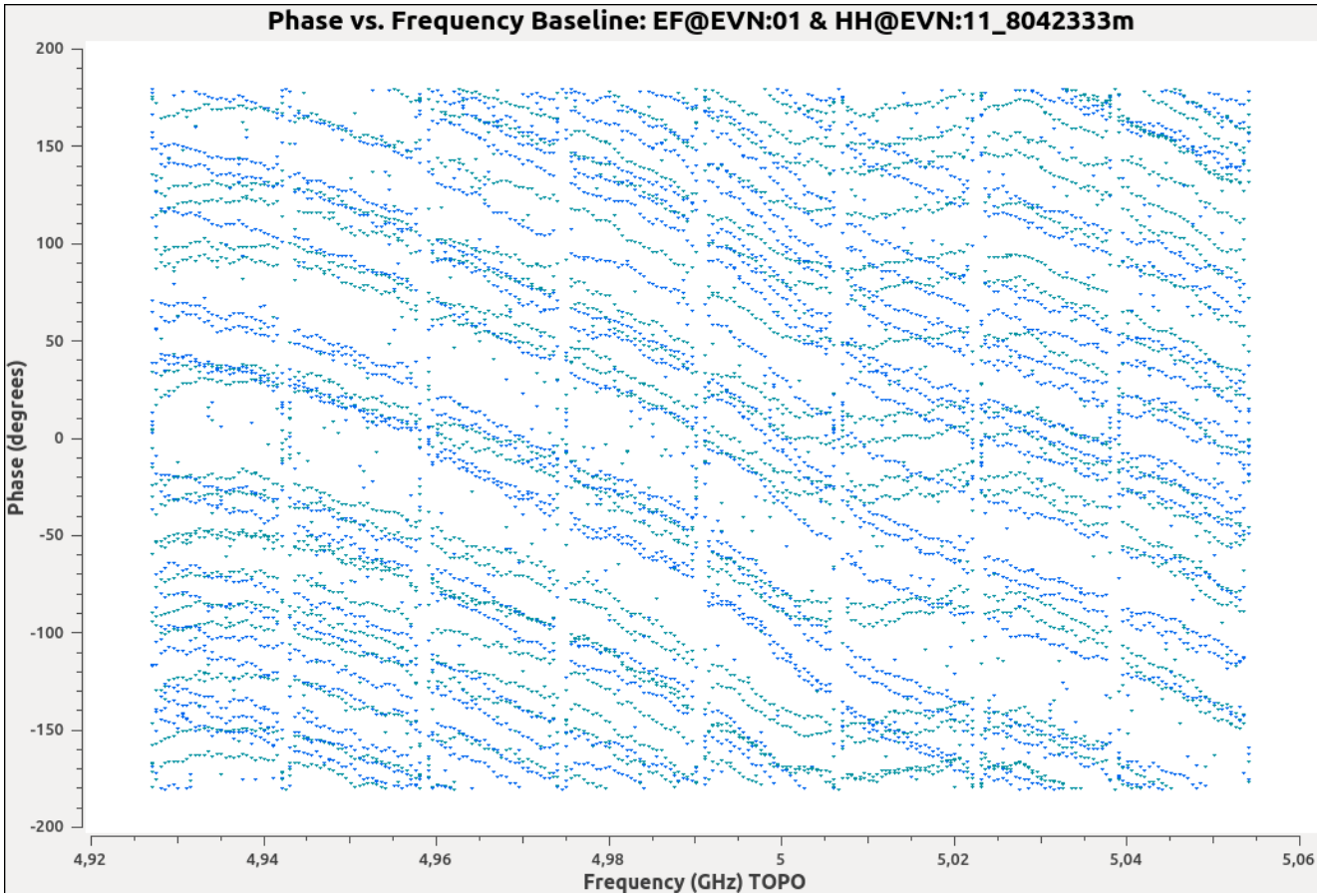
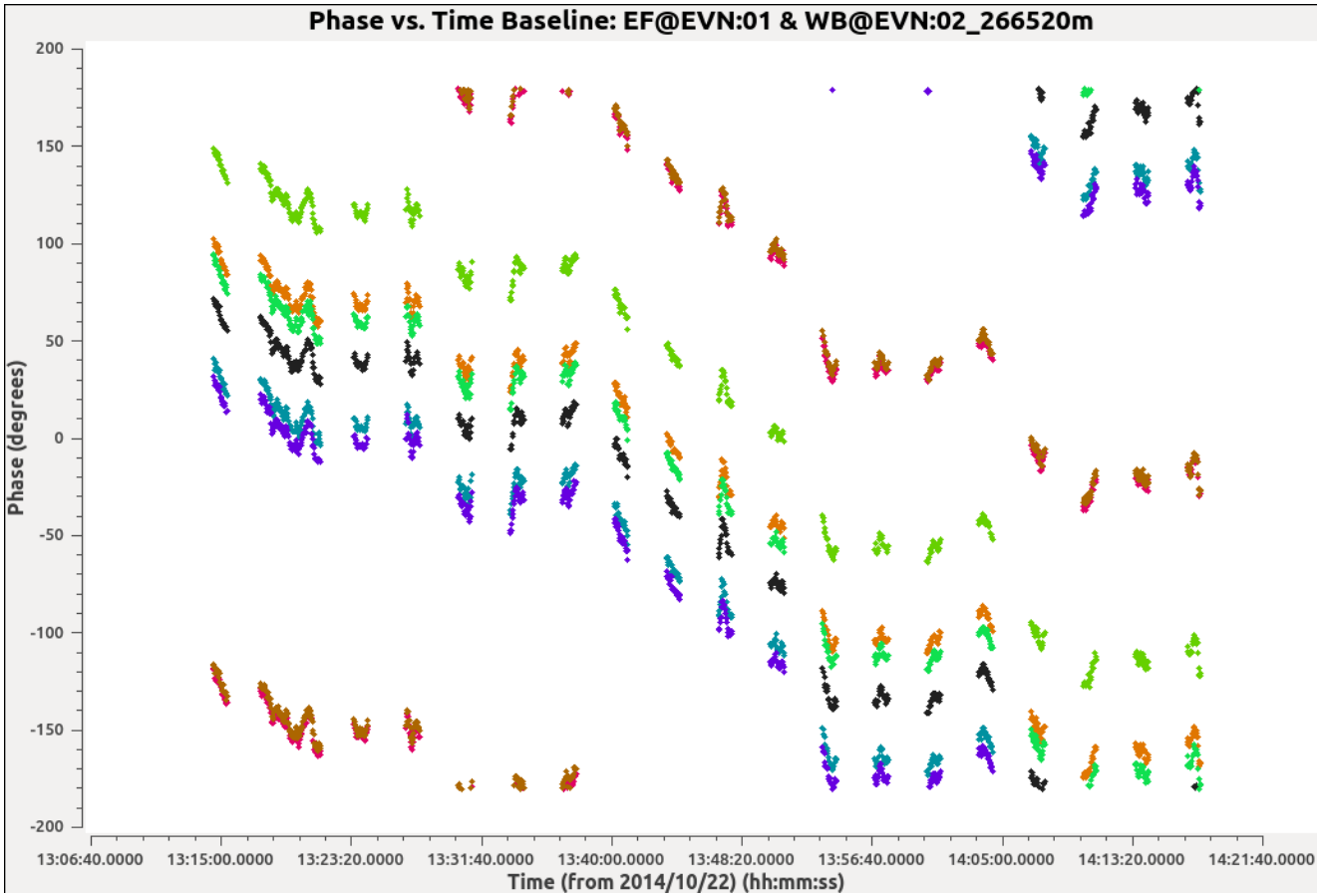
Delay calibration

- Phase vs. Frequency
- Using **gaincal** with **mode='K'**



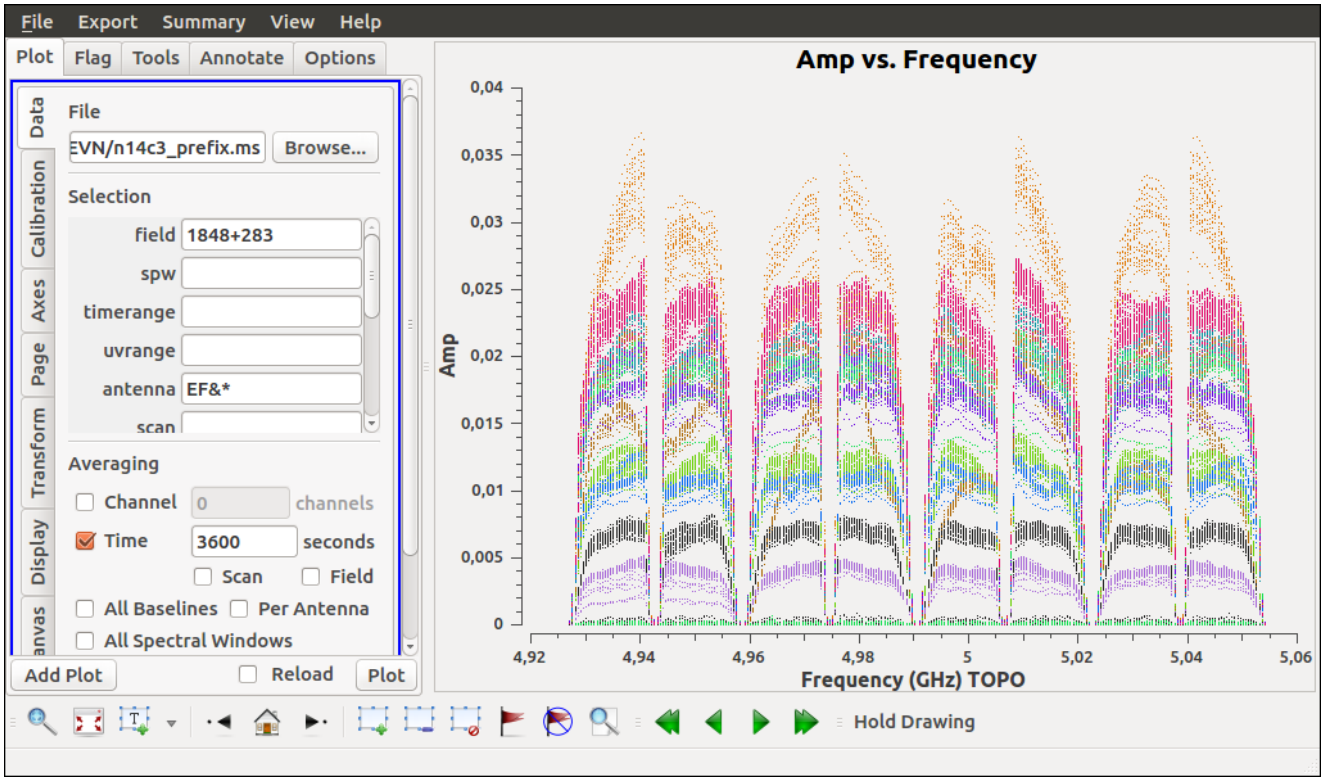
Time-dependent phase calibration

- Phase vs. Time
- Using **gaincal** with **mode='G', calmode='p'**



Bandpass calibration

- Amplitude vs. Frequency
- Using **bandpass**



Applying the corrections

- We apply the corrections using **applycal**
- Creates a new column called **CORRECTED_DATA**.
- Data size grows by a factor ~ 2.
- If we want, we can also split the data with **split**

Deconvolution

- From the previous slide,

$$\mathrm{I}_{\mathrm{Obs}}(l, m) = \mathcal{F}^{-1}[W(u, v)] \circledast \mathcal{F}^{-1}[V(u, v)] \tag{2}$$

  - $\mathcal{F}^{-1}[W(u, v)]$ is called "dirty beam"
  - $\mathrm{I}_{\mathrm{Obs}}(l, m)$ is called the "dirty image"
  - $\mathcal{F}^{-1}[V(u, v)]$ is the "true sky"

- The "dirty image" is the "true sky" convolved by the "dirty beam".
- To get the "true" sky image $\rightarrow$ we deconvolve our "dirty image" with the "dirty beam"

Imaging parameters

- **imagename** - output name
- **imsize** and **cell**
- **weighting** - natural, uniform, and Briggs.
- **niter** and **threshold**
- We can set a mask while cleaning
- Explore advanced calibration techniques depending on your source and the telescope.

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Further contact

- Things don't stop here.
- Lectures and tutorials will be available at `http://sarrvesh.github.io/dara2018.html`
- If you have further questions,
  - Sarrvesh – `sarrvesh@astron.nl`
  - Dalmiro – `dmaia@fc.up.pt`

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