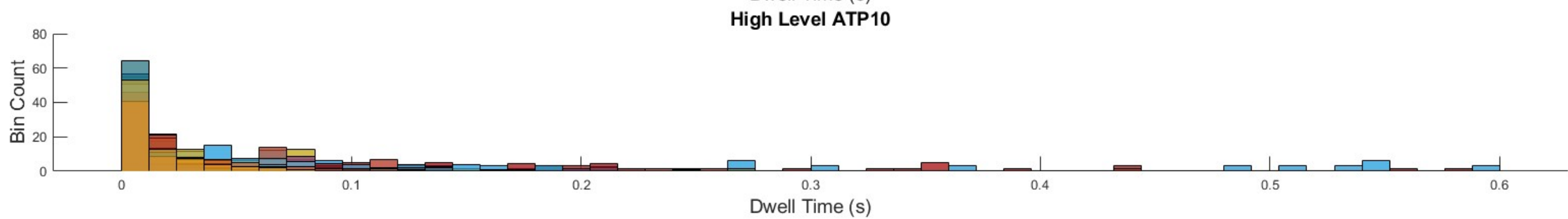
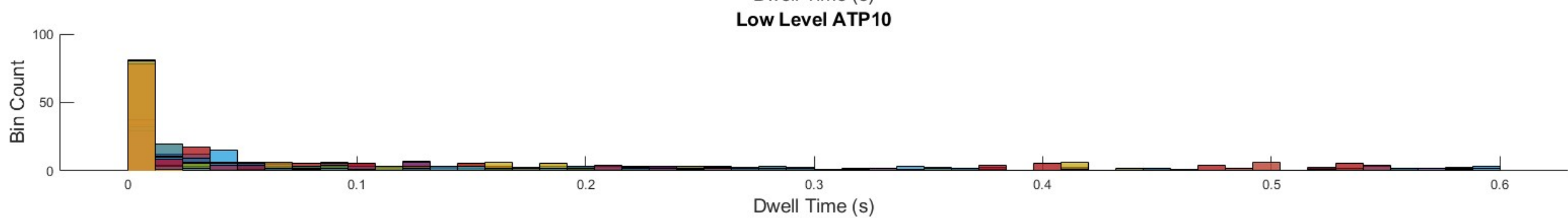
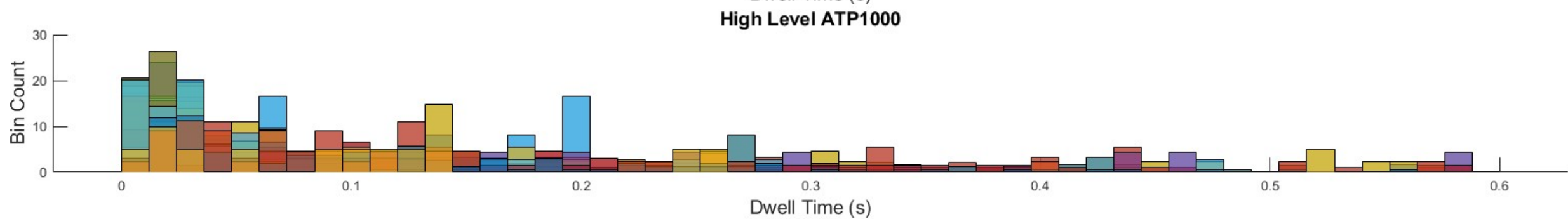
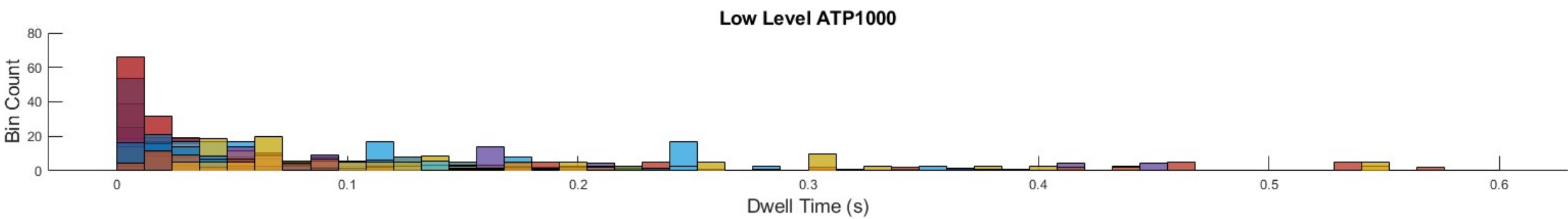


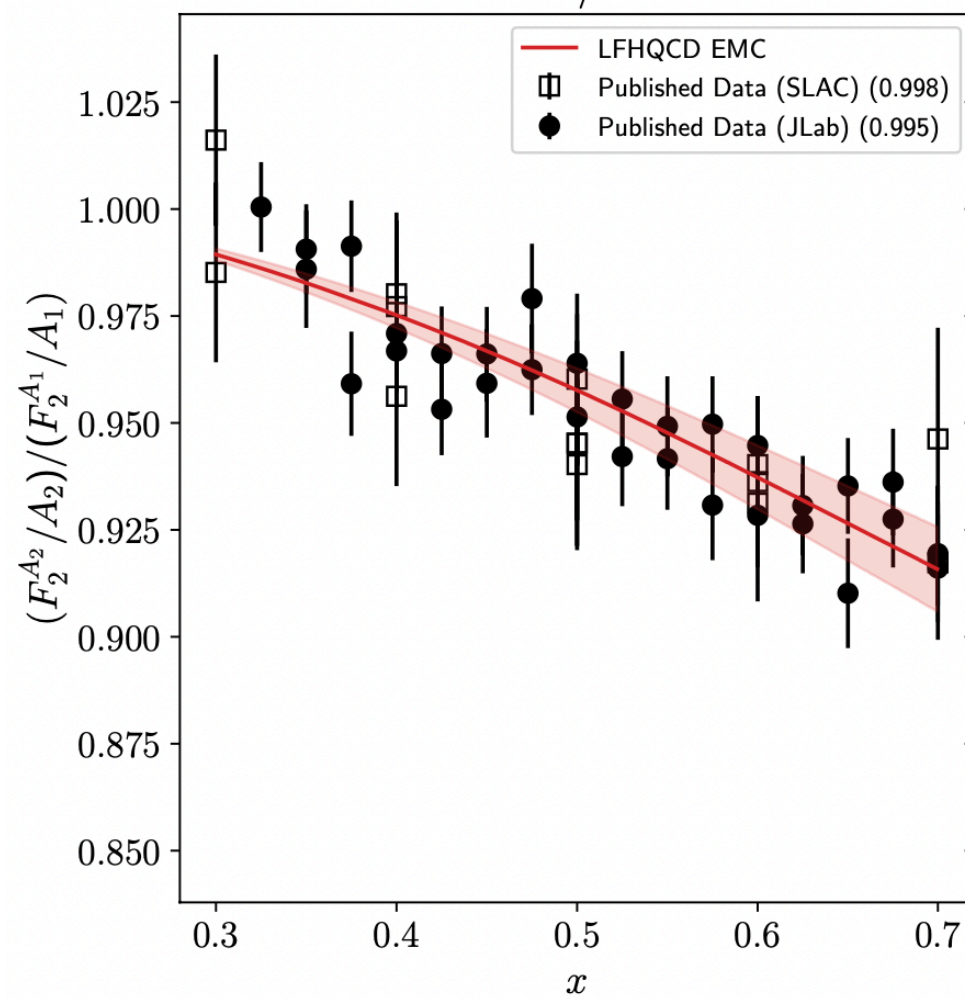
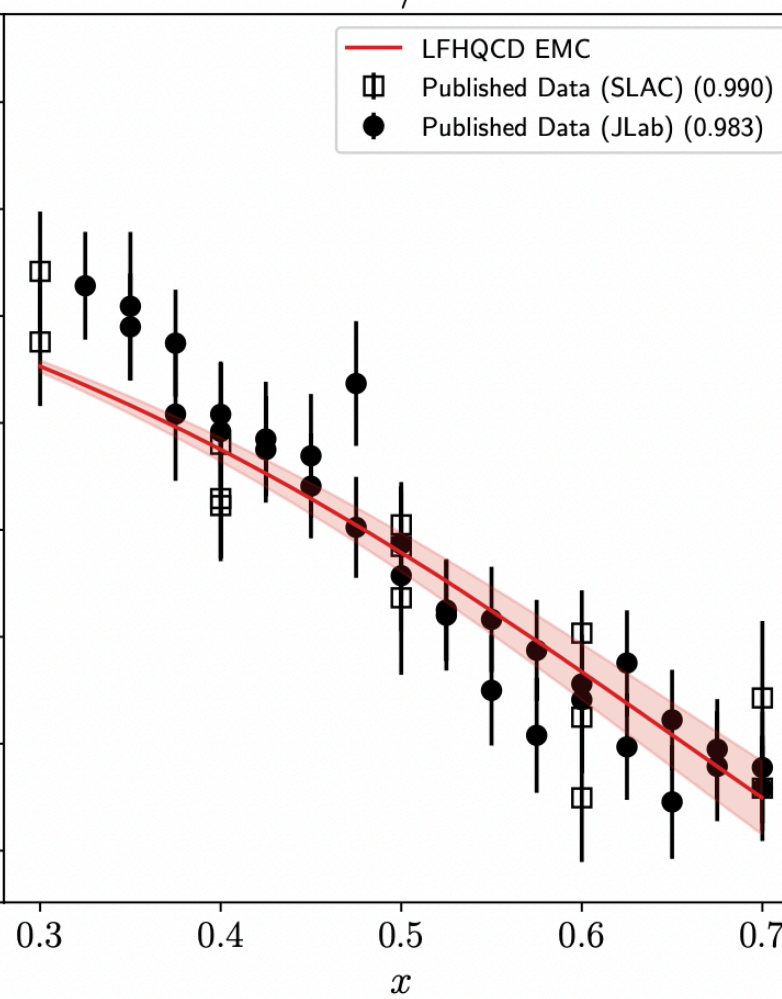
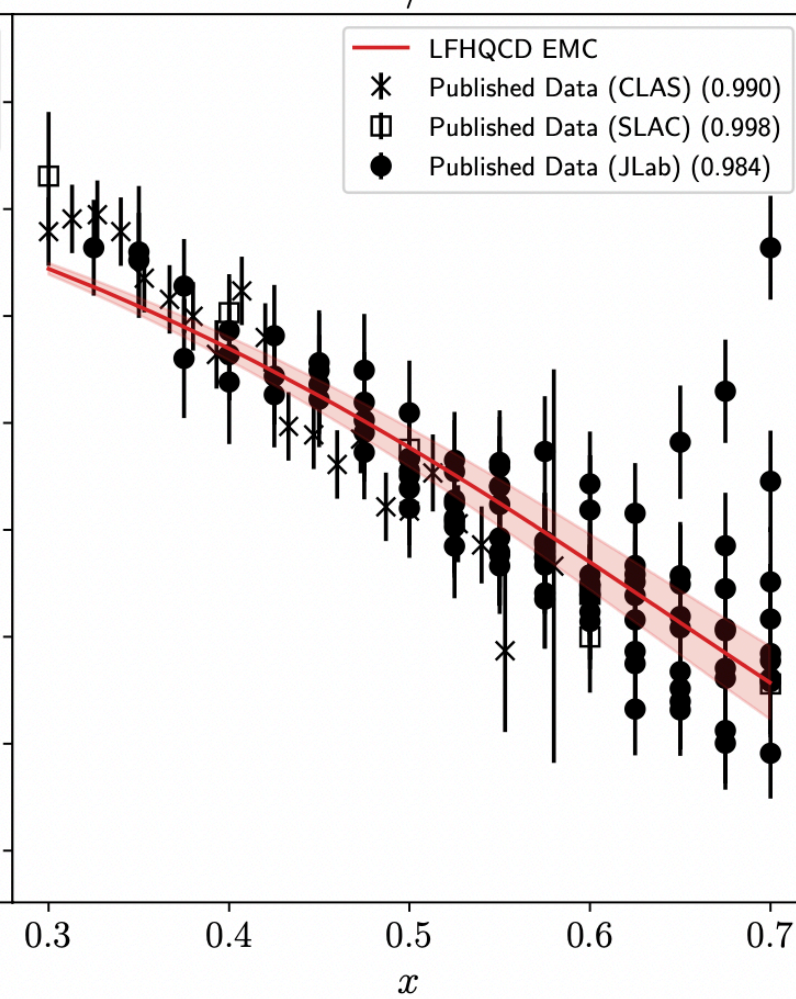
# Class 5: Plot workshop

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Miguel F. Morales

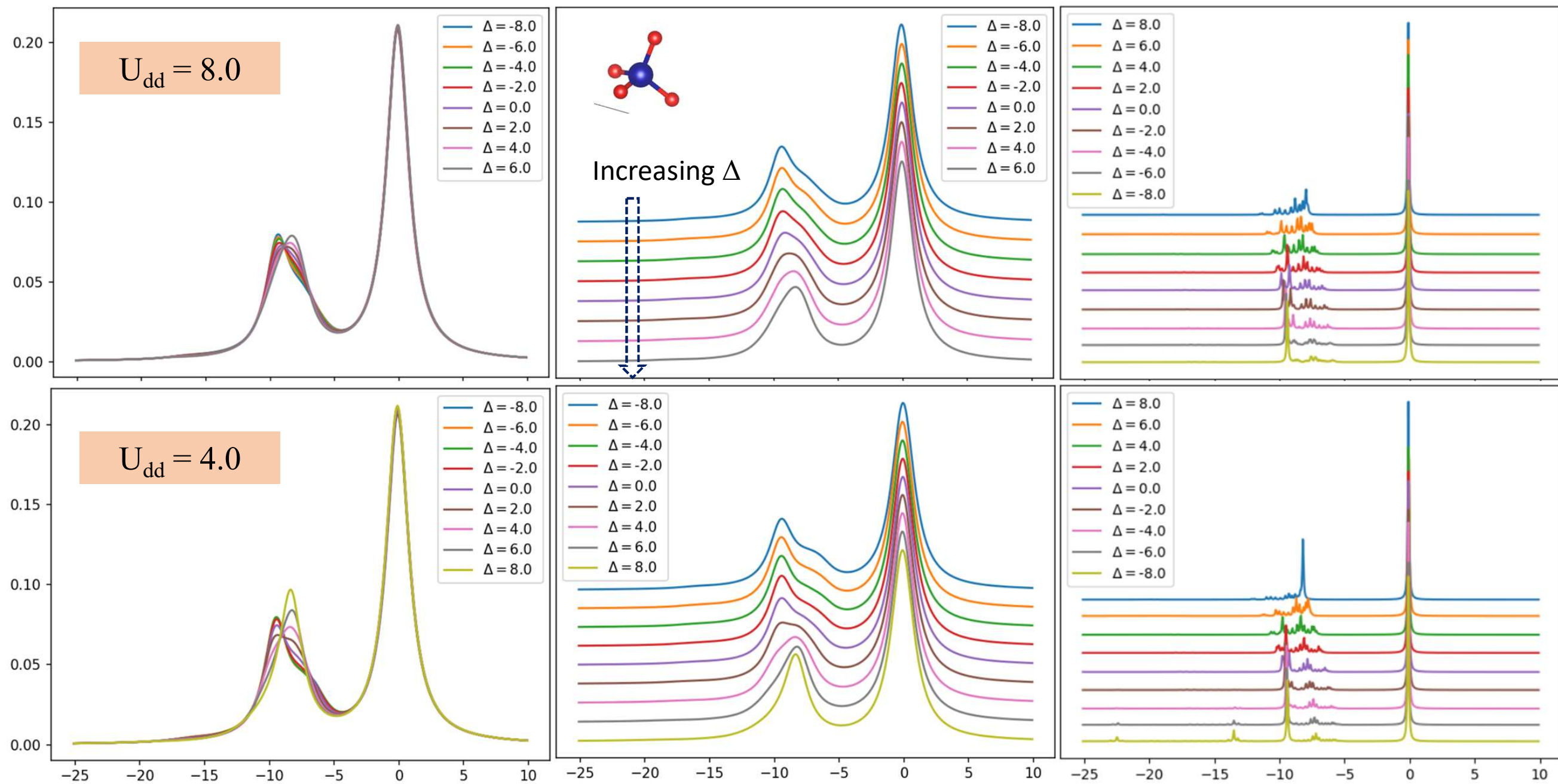
Bryna Hazelton



${}^4\text{He}/{}^2\text{H}$  ${}^9\text{Be}/{}^2\text{H}$  ${}^{12}\text{C}/{}^2\text{H}$ 

Dmitriy

# PbCrO<sub>4</sub> K $\alpha$



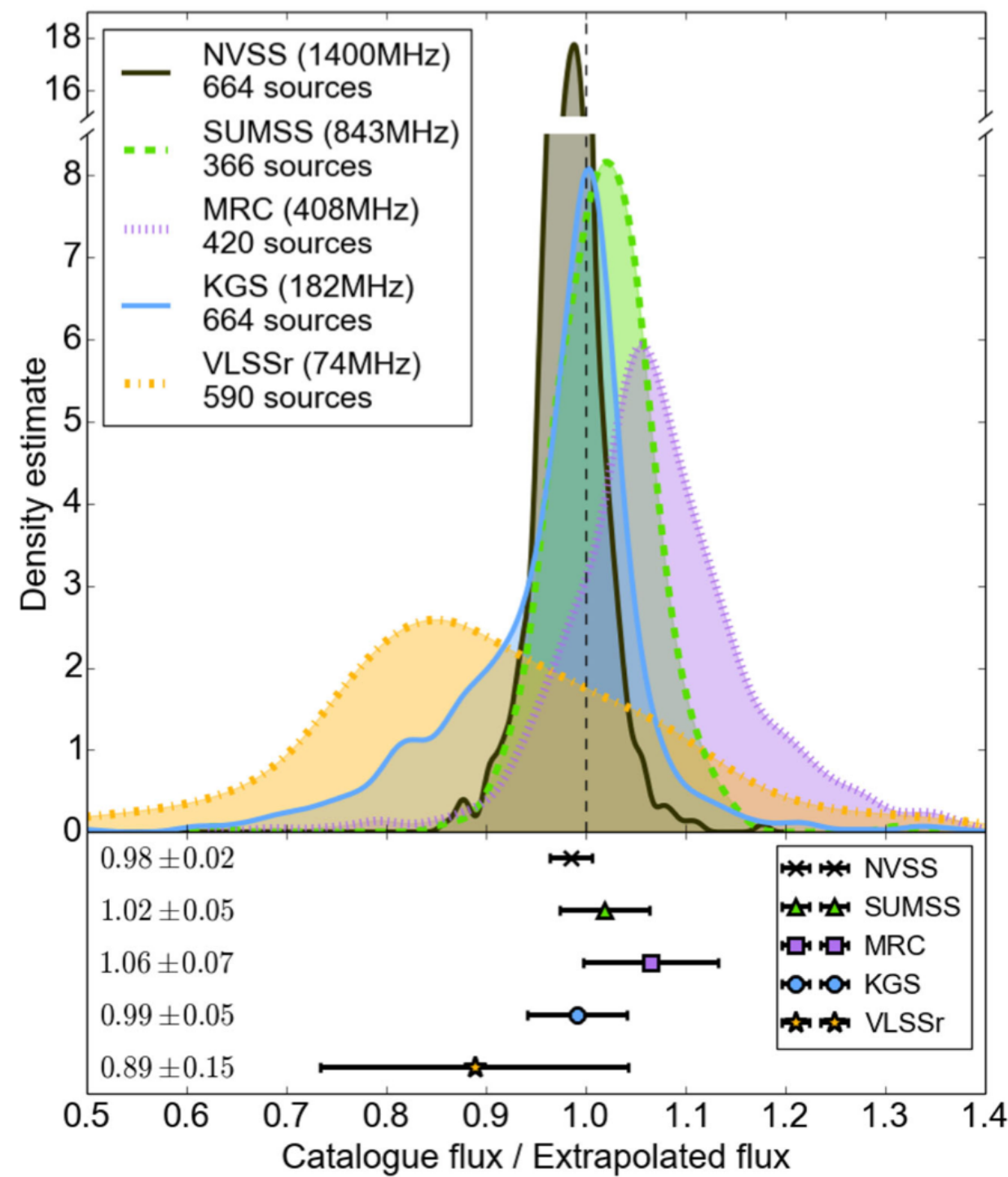


# Plot workshop

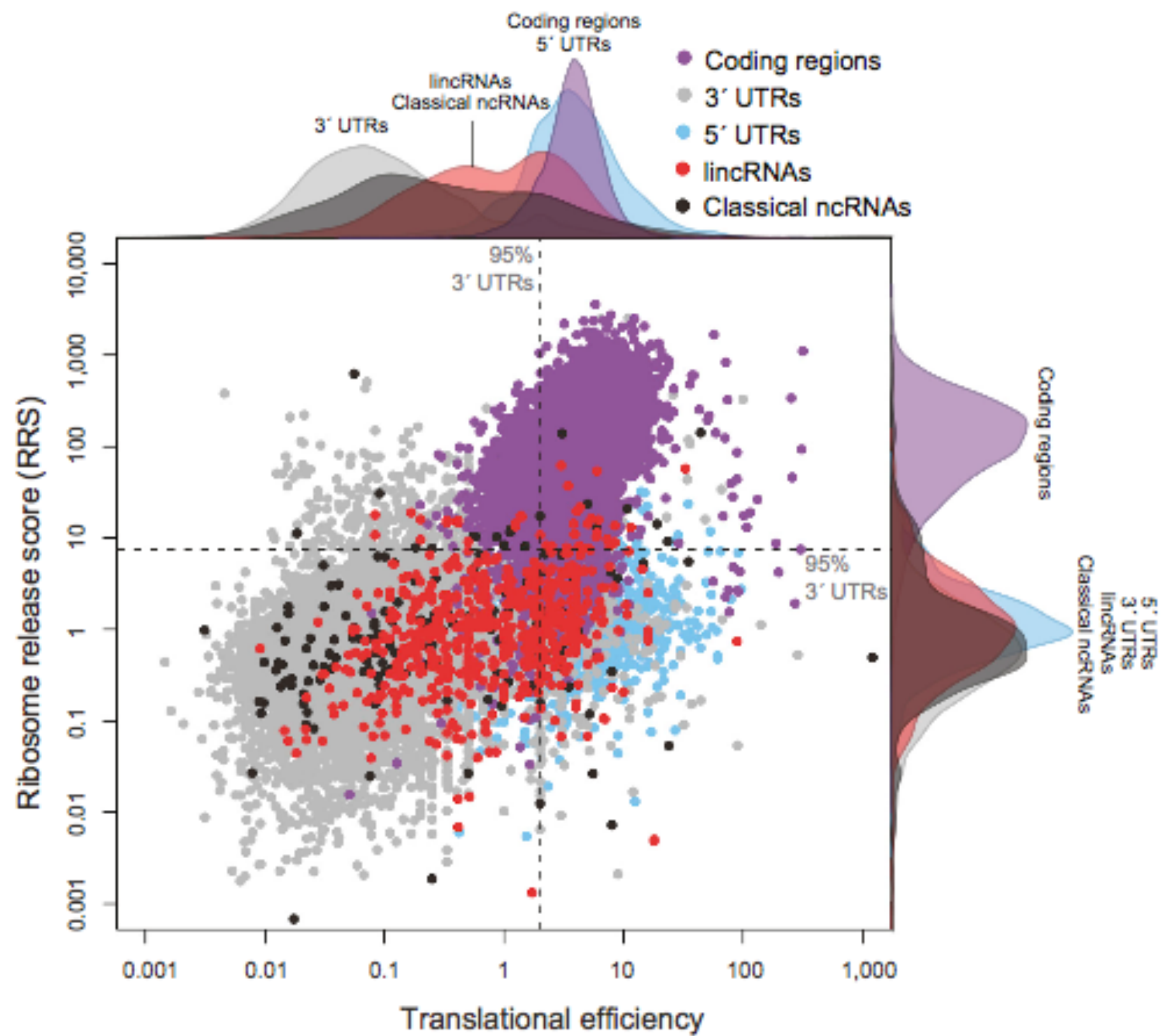
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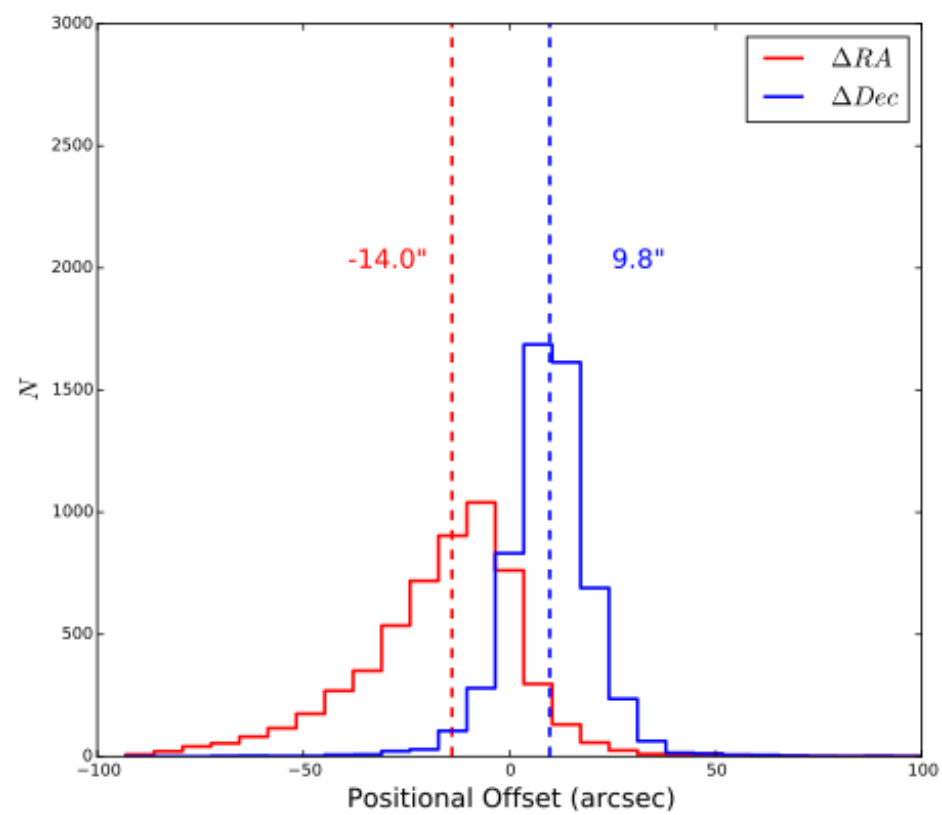
- Briefly describe science
- What is the question you want to answer with this plot?
  - Identify key information & information that is less important
  - Identify key comparisons
  - What can make plot easier to absorb?
  - Are there red herrings?
- Is there additional information you need to answer the question?
  - Can it be added to the plot (in a digestible way)?
  - Is there a partner plot (plot story)?

Data density examples

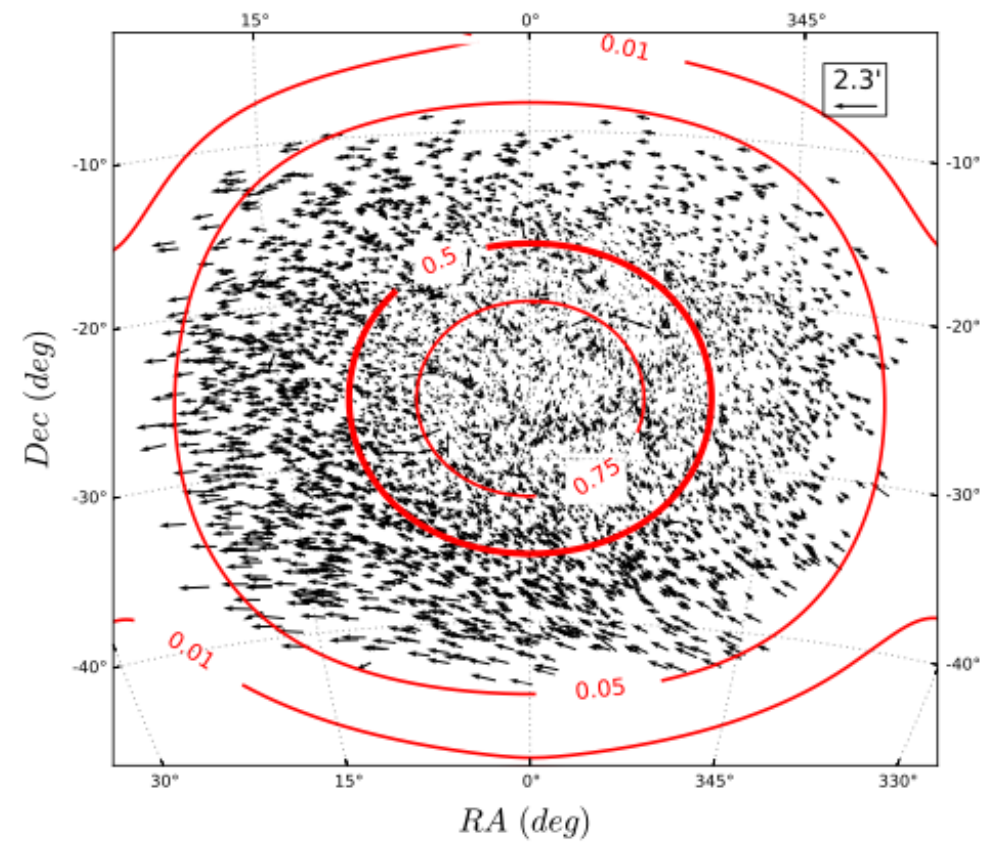


**Figure 2.** The ratio between observed flux density and extrapolated flux density from a fit to the SED is shown for every time a catalogue appeared in a match with at least two other catalogues for isolated sources. The upper panel shows a univariate kernel density estimation of each distribution (note broken y axis due to the sharp peak in the NVSS ratio distribution), while the lower panel shows the median and median absolute deviation of each distribution. The KGS spectral index agrees very well with no indication of flux bias on average.

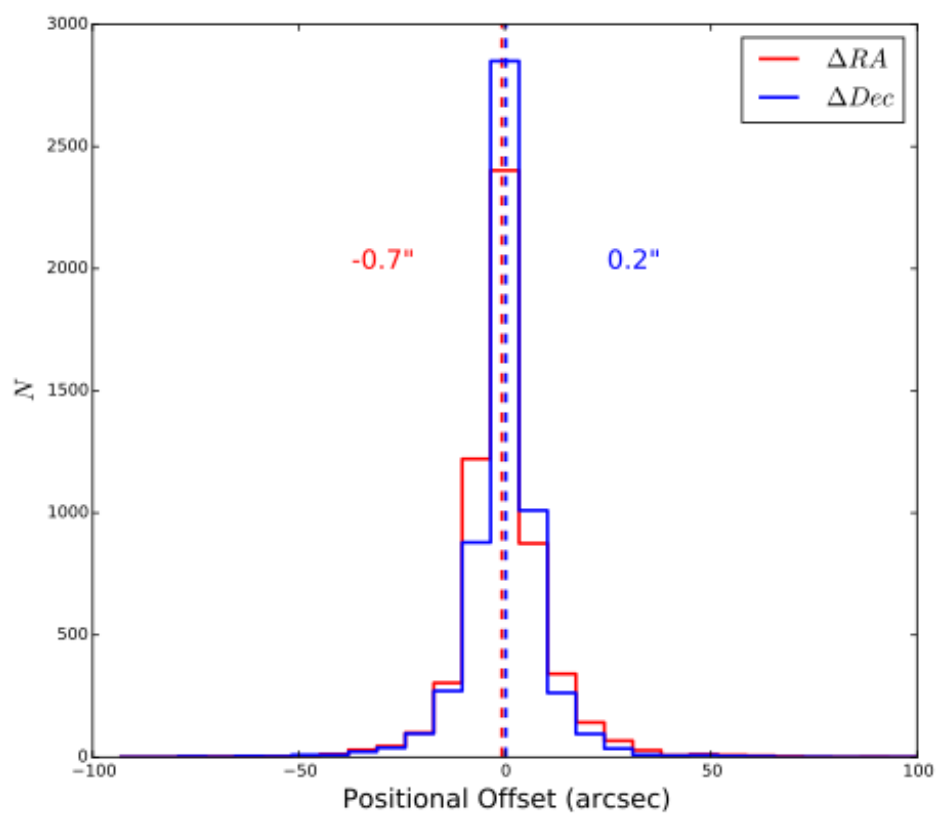




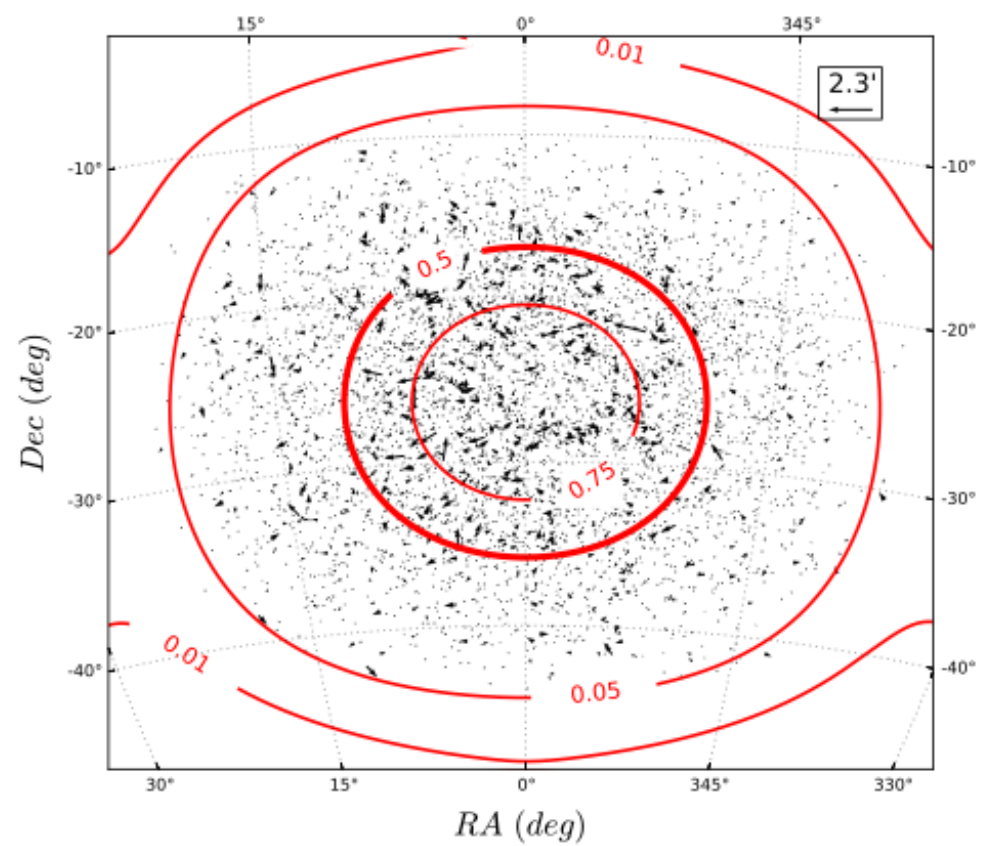
(a)



(b)

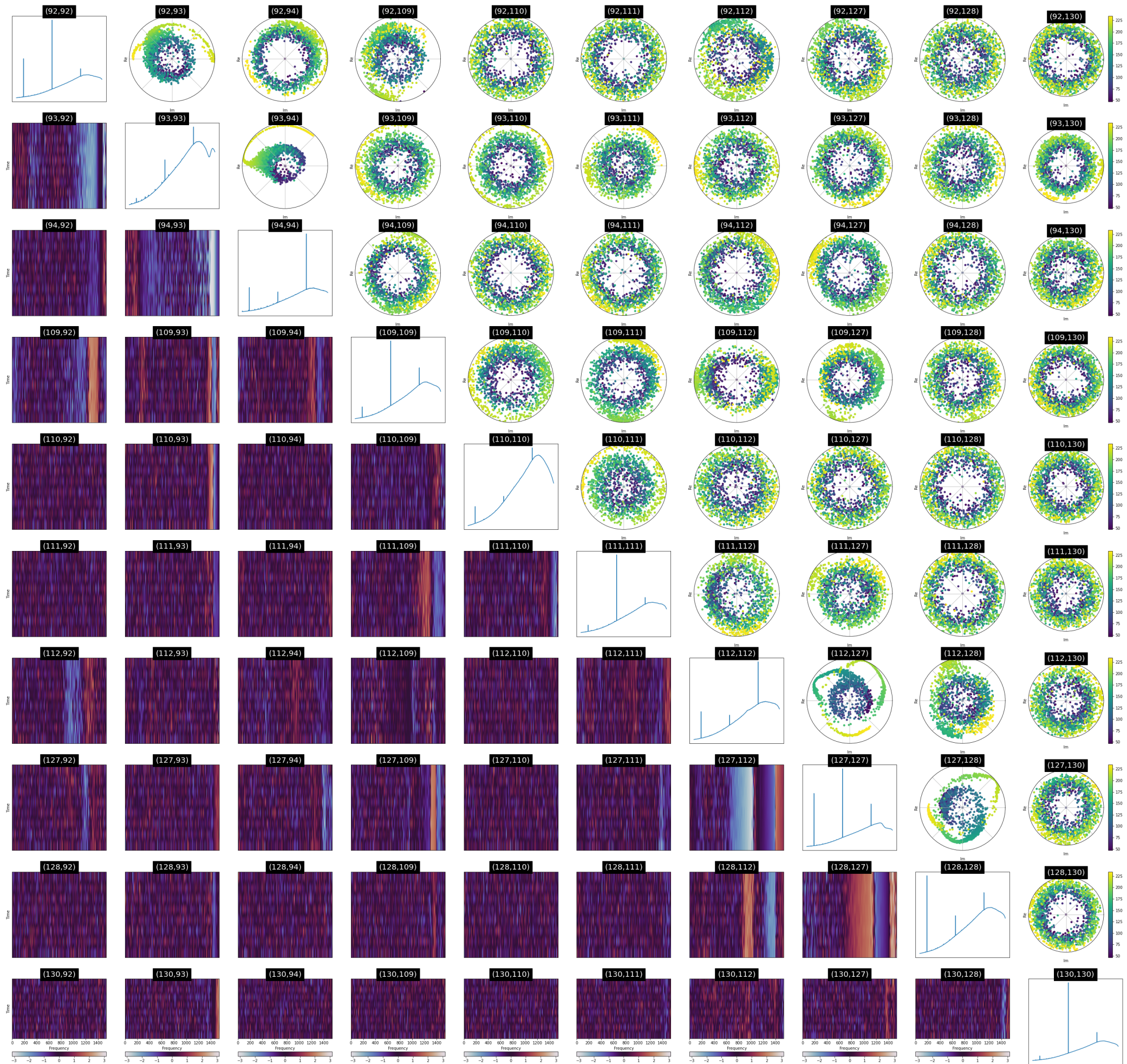


(c)



(d)







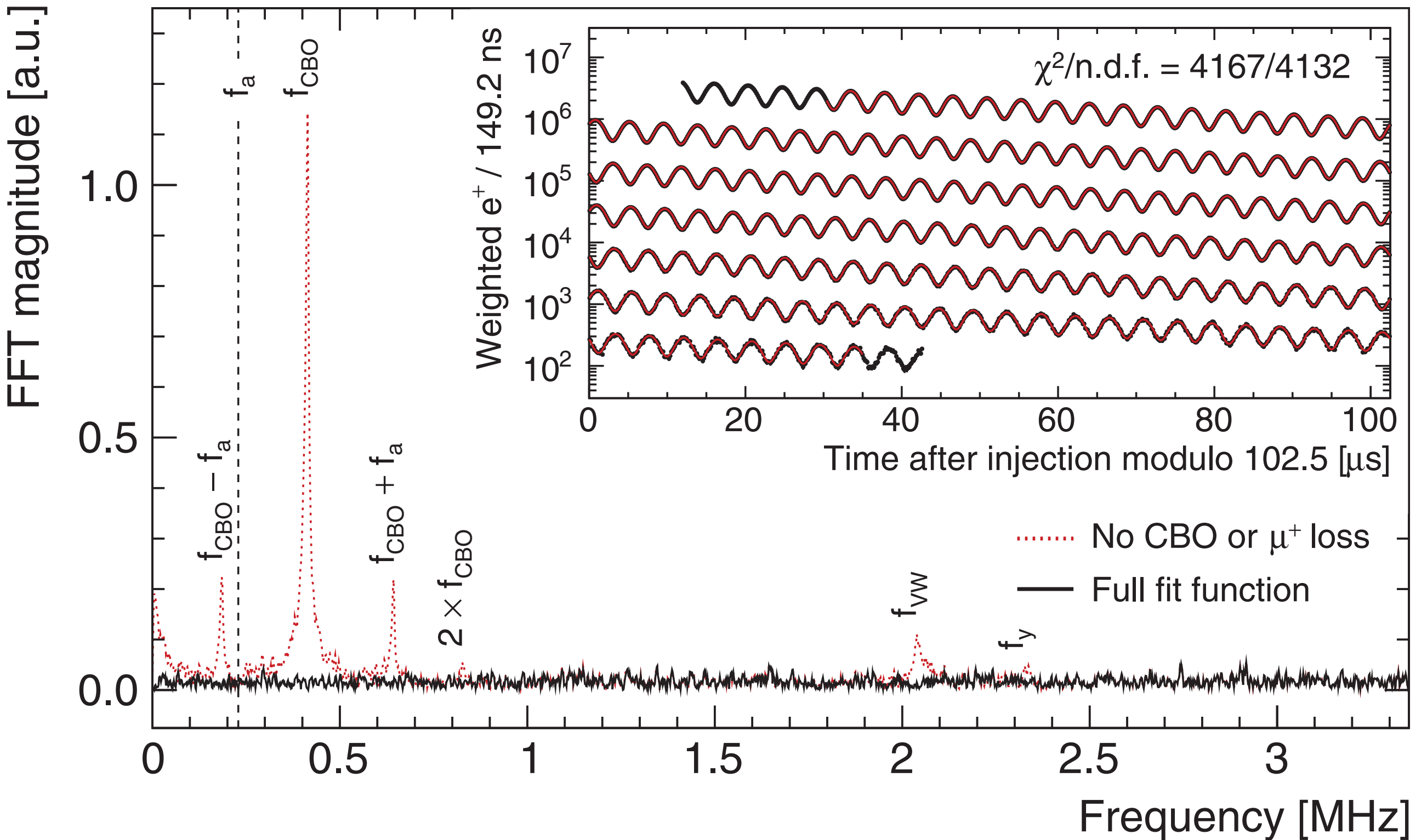
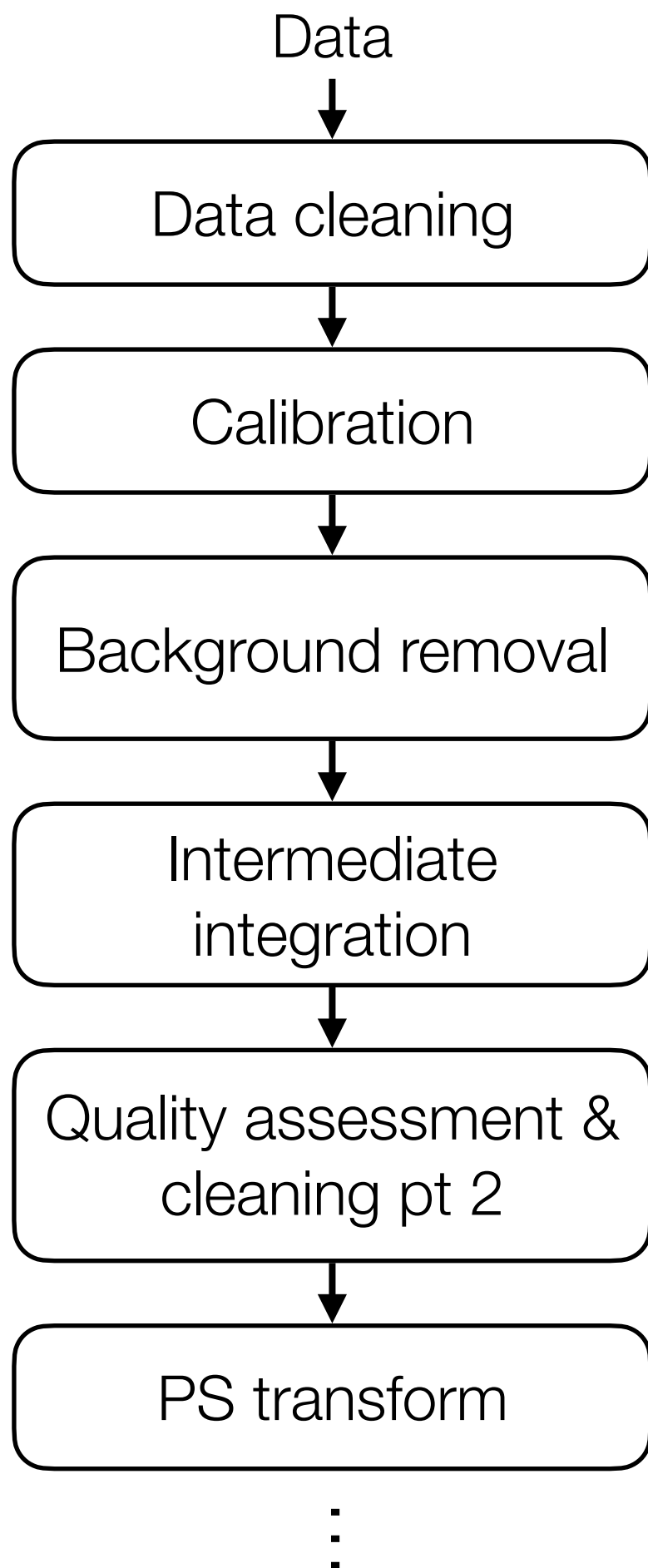
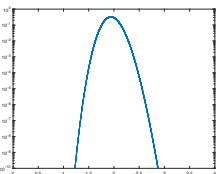
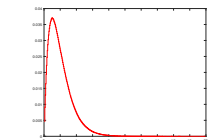
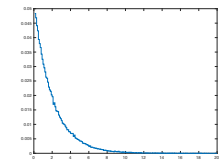
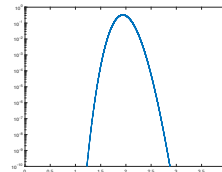


FIG. 2. Fourier transform of the residuals from a time-series fit following Eq. (5) but neglecting betatron motion and muon loss (red dashed), and from the full fit (black). The peaks correspond to the neglected betatron frequencies and muon loss. Inset: asymmetry-weighted  $e^+$  time spectrum (black) from the Run-1c run group fit with the full fit function (red) overlaid.

Worries, Plots & Tests



## Error Model



⋮

## Worries

Thunder storms

Biasing result

Temperature  
dep. offset

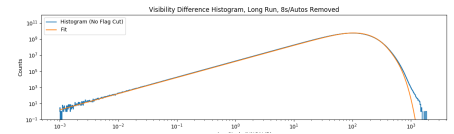
Signal leakage

⋮

## Tests



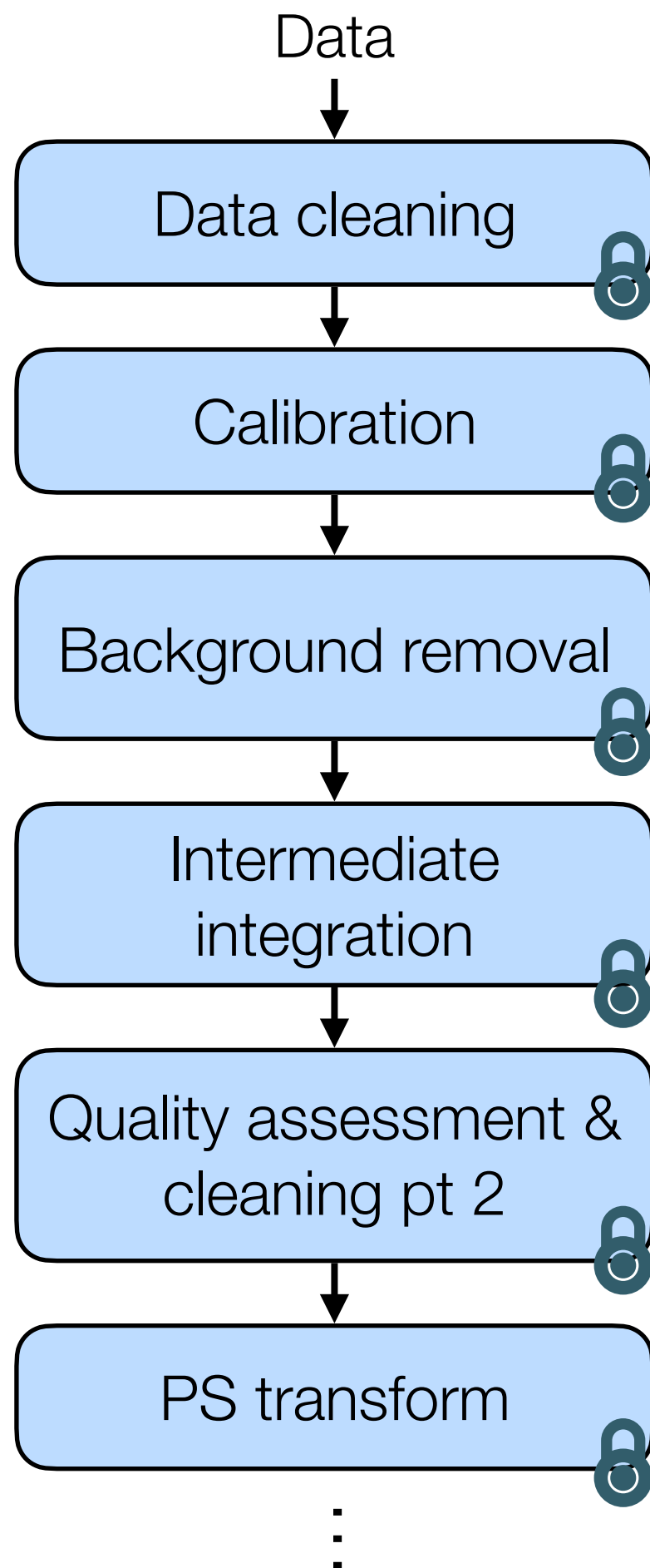
Jackknife



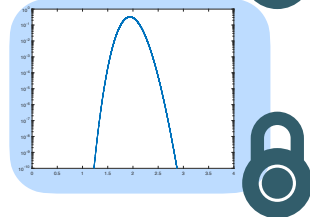
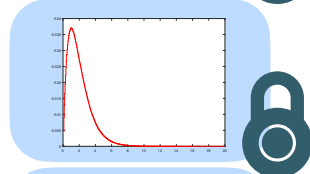
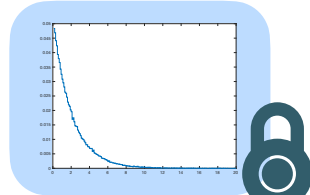
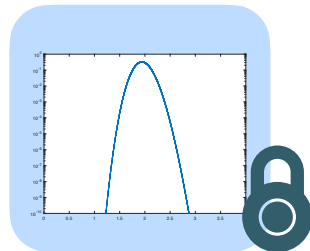
Correlation

Injection test

⋮



## Error Model



⋮

## Worries

Thunder storms

Biassing result

Temperature  
dep. offset

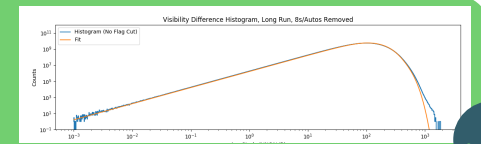
Signal leakage

⋮

## Tests



Jackknife



Correlation

Injection test

⋮



**Version controlled software**



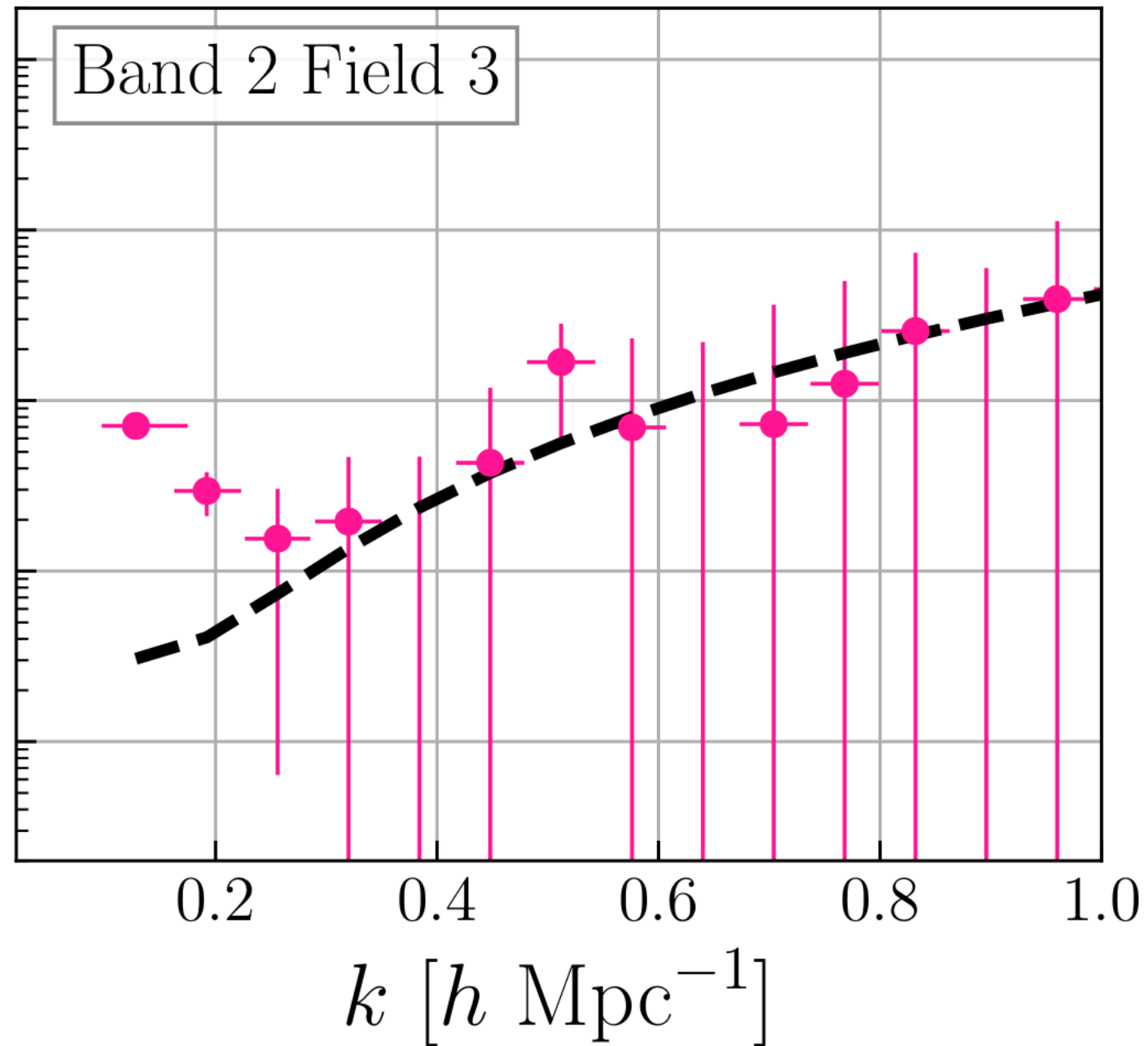
**GitHub issues**



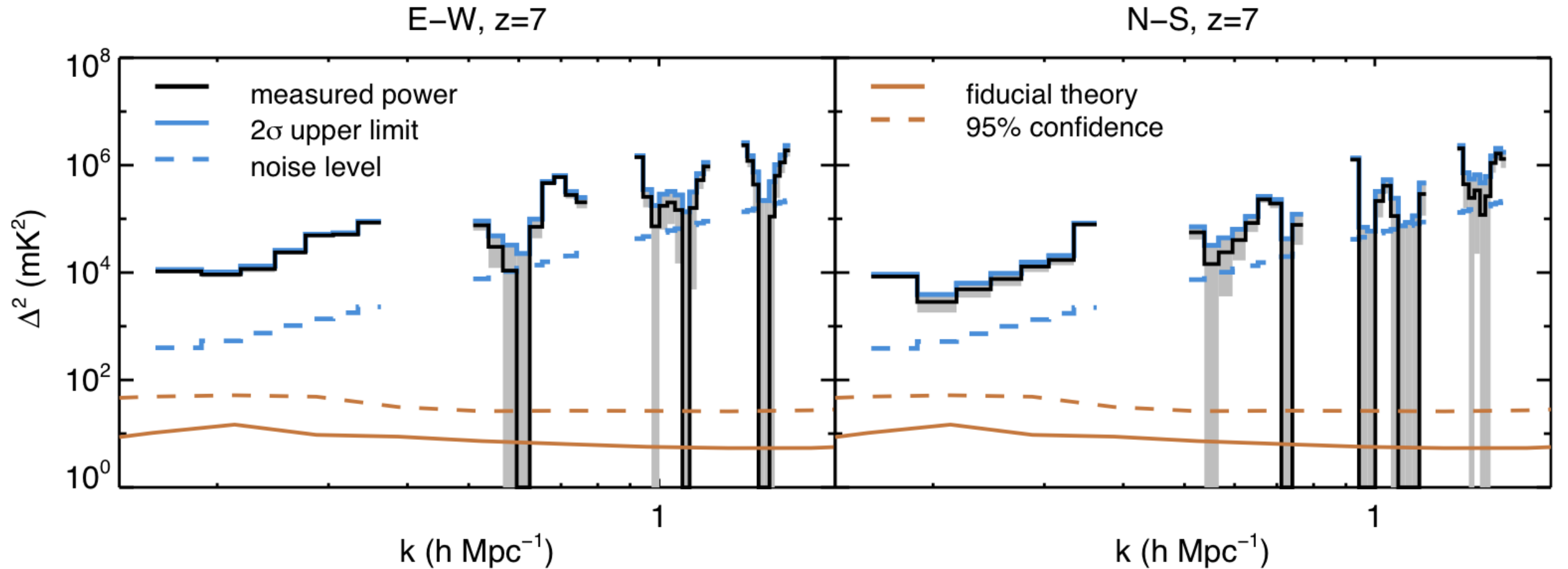
Emphasis critiques

# Upper limit?

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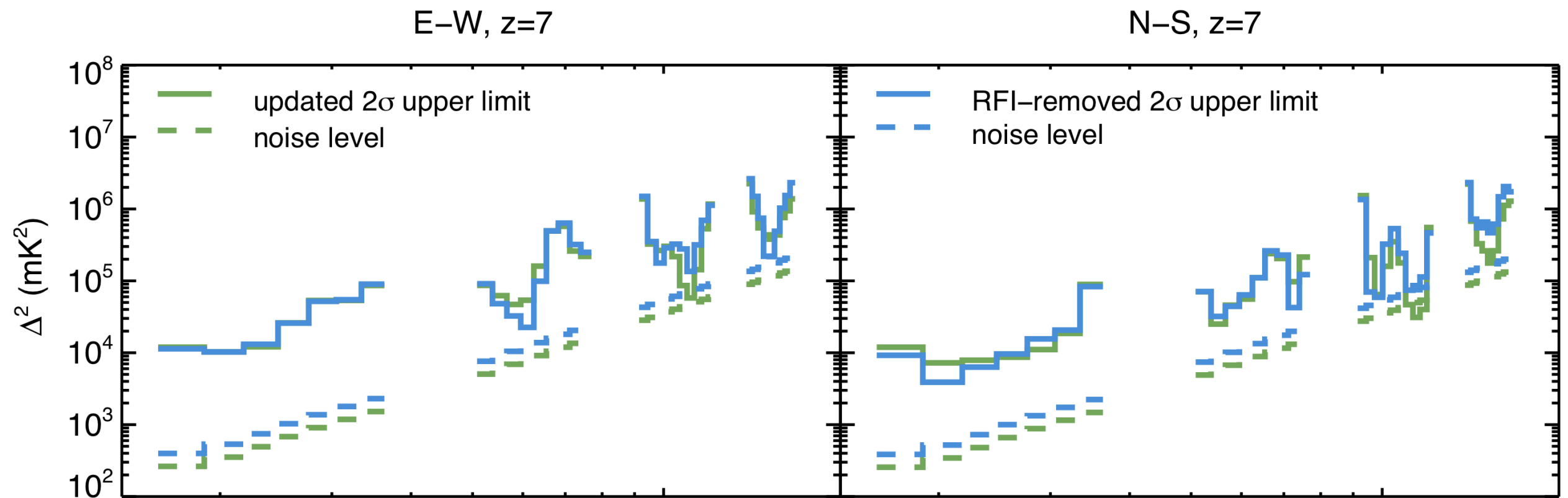
# Upper limit



**Figure 6.** The 1D measured power spectra (black), the  $2\sigma$  error bars (grey), the  $2\sigma$  EoR upper limits (solid blue) and the  $1\sigma$  thermal noise levels (dashed blue) for the E–W and N–S polarizations using 678 observations selected with SSINS. We also present an example fiducial EoR theory power spectrum (solid brown) along with the theoretical  $2\sigma$  upper limits on the 21 cm power spectrum amplitude (brown dashed) obtained using existing observational constraints (see Appendix A for further details).

These constitute our best EoR upper limits in this work. We are noise dominated for many  $k$ -modes, including our lowest EoR upper limit.

# Upper limit



A single-time instance of power spectra from the toy-model simulation

