

NCAC Annual Meeting

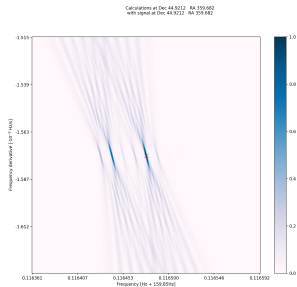
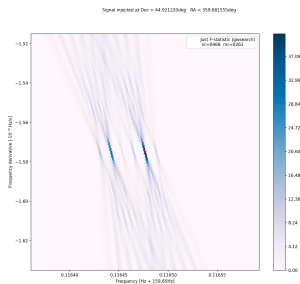
Przemysław Figura

Collaborators: Michał Bejger, Paweł Ciecieląg,
Sudhagar Suyamprakasam.

Warsaw, 31.01.2024.

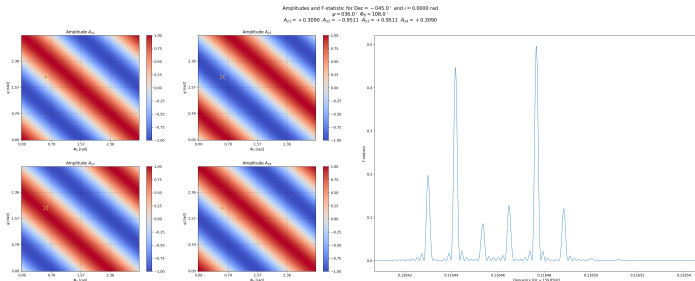
Numerical code progress

- Development of trigger search algorithms.
- Comparison of results obtained from search pipeline with results from initial Matlab code.



Analysis of gravitational-wave signal in F-statistic form

- How far on the sky from the injection point the signal can be detected.
- Signal form/profile dependence on various parameters generating the signal.
- Time dependence of the signal due to Earth's orbital motion Doppler effect.



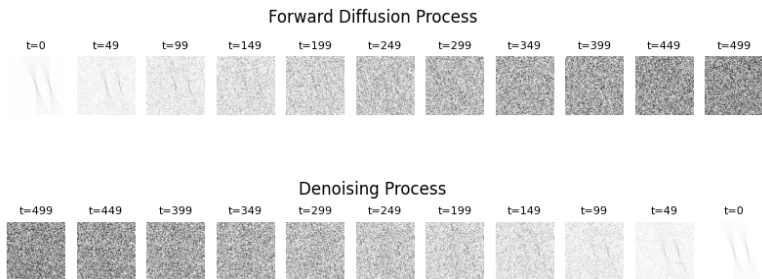
Analytical study of F-statistic equations

- Form of F-statistic as a sum of signal and noise.
- Enhancement/diminishing of signal within noise.

$$\mathcal{F}(n + \kappa s) = \mathcal{F}(n) + \kappa^2 \mathcal{F}(s) + \kappa \mathcal{G}(n, s)$$

F-statistic analysis using Denoising Diffusion Probabilistic Models (DDPM)

- Gradual noise addition to F-statistic signal.
- Neural network training.
- Denoising of signal by neural network.



Thank you. :-)