30f\_fs{hd}\_ceffyl data repo

Contains probability densities from a kernel density estimator representing the HD-correlated PTA free spectrum to be used with the ceffyl software package.

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How to use: In ceffyl, set the `datadir` path to this directory. Everything else is sorted under the hood

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Analysis:

Dataset: NANOGrav 15 year data set - all 67 pulsars

Free spectrum analysis: 30 freq powerlaw intrinsic red noise + 30 freq HD-correlated free spectrum + DMX

KDE: KDEpy FFTKDE with Epanechnikov kernel, Sheather-Jones bandwidth, trained on HD-correlated free spectrum only

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density.npy: array of log PDFs extracted from the KDE representations of the PTA free spectrum

log10rholabels.txt: labels for log10rho parameters used in free spectrum analysis

log10rhogrid.npy: grid of log10rho used to extract PDFs from the KDE representations of the free spectrum posteriors

freqs.npy: list of GW frequencies used in analysis

bandwidths.npy: bandwidths of kernels to create the KDEs

pulsar\_list.txt: list of pulsars to choose to refit (for PTA free spectrum refit, this is just set to ‘freespec’ as single pulsars cannot be added/removed)