



Inspiral Group Calibration Studies

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LIGO Scientific Collaboration
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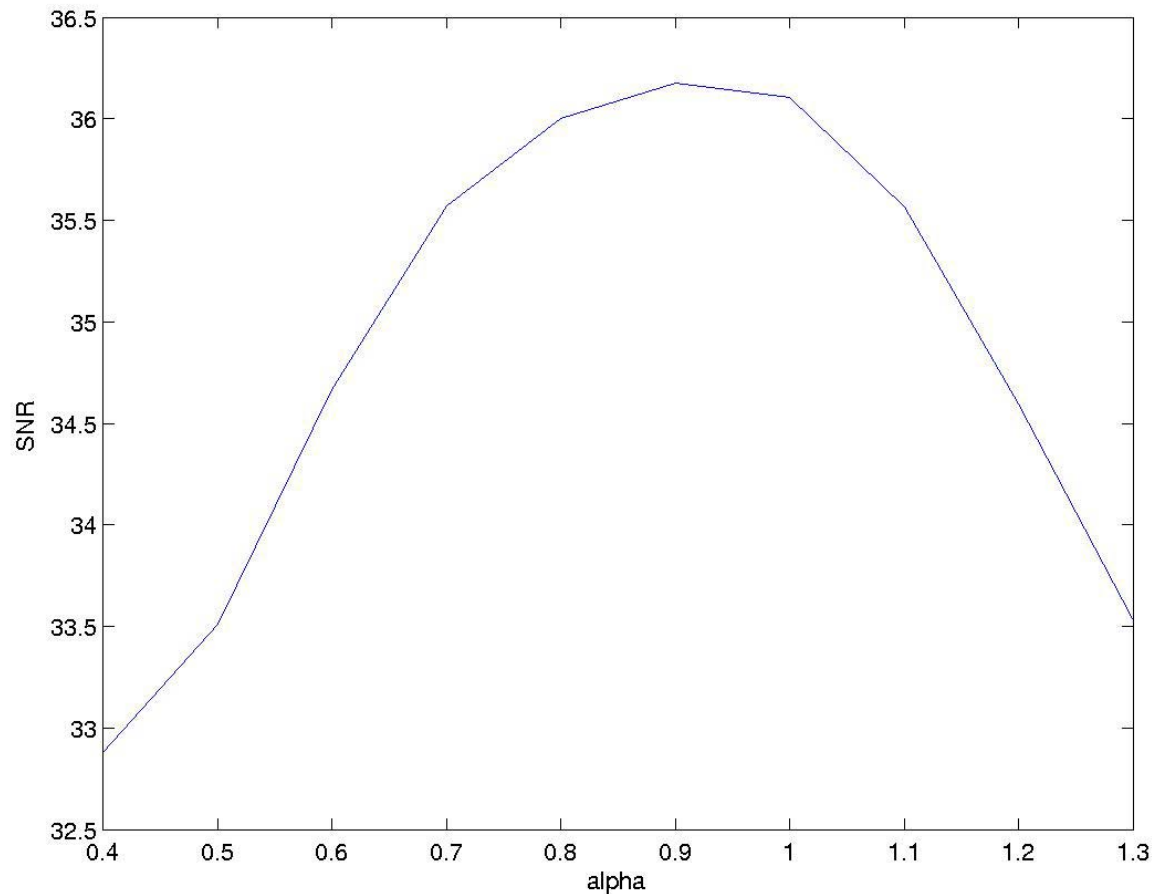
LIGO-G030136-00-Z

Hardware Injections

- Study of S1 calibration was performed with hardware injections
- Injected several 1.4, 1.4 solar mass inspiral signals into L1:LSC-DARM_CTRL after the run
- Analyzed injection data with several different calibrations ($\alpha = 0.4, \dots, 1.4$)
- Analyzed injection data using correct template and full pipeline
- Did we detect injection signals?
- Are the detected parameters (mass, distance, etc...) correct?

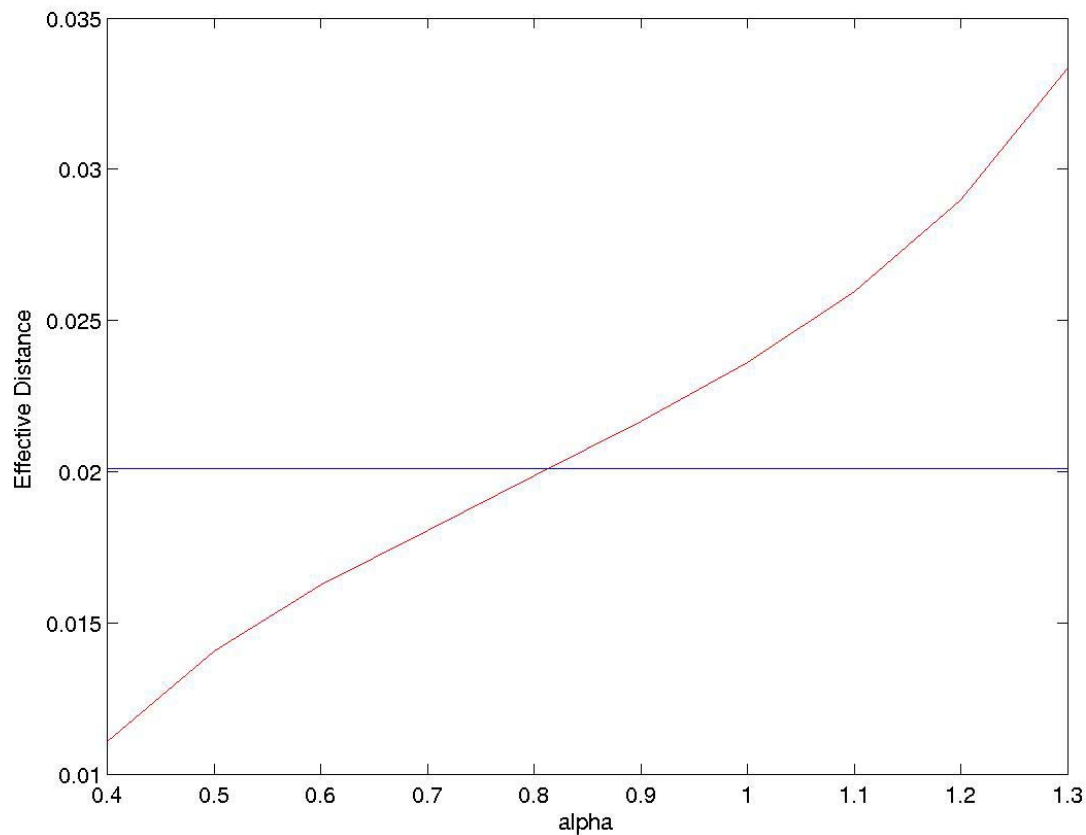


Results from Exact Template (SNR)

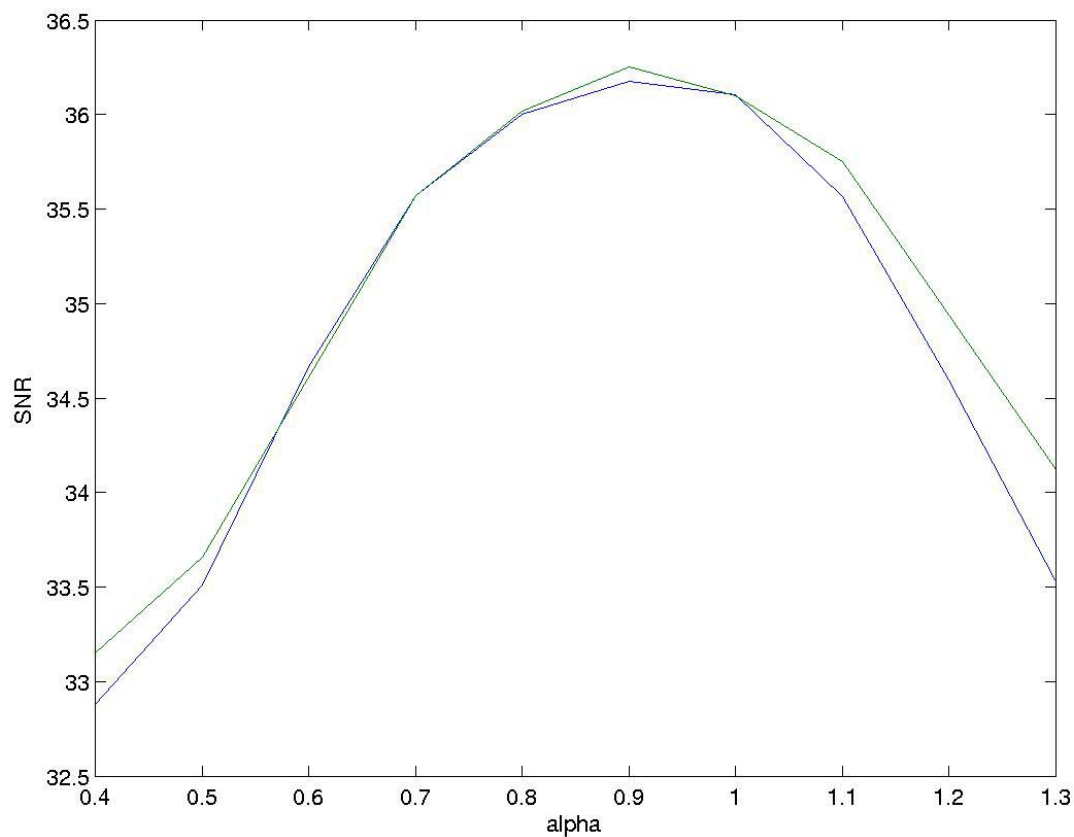




Results from Exact Template (Distance)



Results from Template Bank



Conclusions

- Fractional loss in signal to noise ratio is quadratic in $\Delta\alpha$ (as expected)
- Error in effective distance is linear in errors in $\Delta\alpha$
- When using full template bank, loss in SNR is not as great as neighbouring templates pick up loss (error to be quantified later)
- For 10% error in alpha, 0.4% loss in SNR