Pressure measurements

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POA

1. Focus on 50psi ph calibration signals
2. Show the raw signals
   - Show loglog for 3 cases.
   - No noise, w. background noise, white noise ?
3. Show the spectra
4. Show with HP filtering
5. Apply transfer function and show the TF
6. Determine whether a LP filter can be applied at $f = 2kHz$
   - $T^+ \equiv Tu_\tau^2/\nu$
   - at 50psi $Re_\tau \approx 5000$ $u_\tau \approx 0.51$, $\nu \approx 1.43$
   - $T^+ = 20 \rightarrow f = 948Hz$
7.

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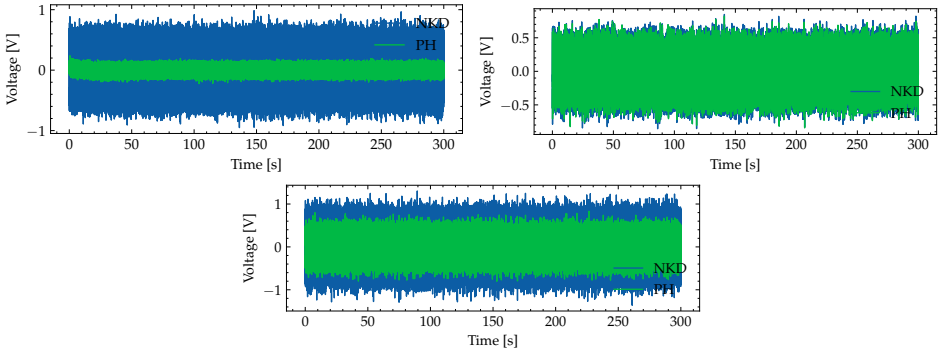
Raw signals



Top left: white noise, **top right:** *only* facility noise, **bottom:** white noise + facility noise

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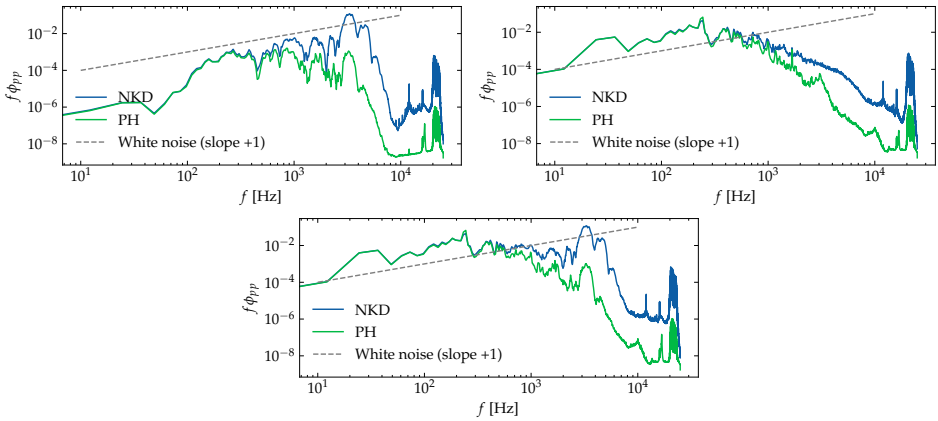
Raw Spectra



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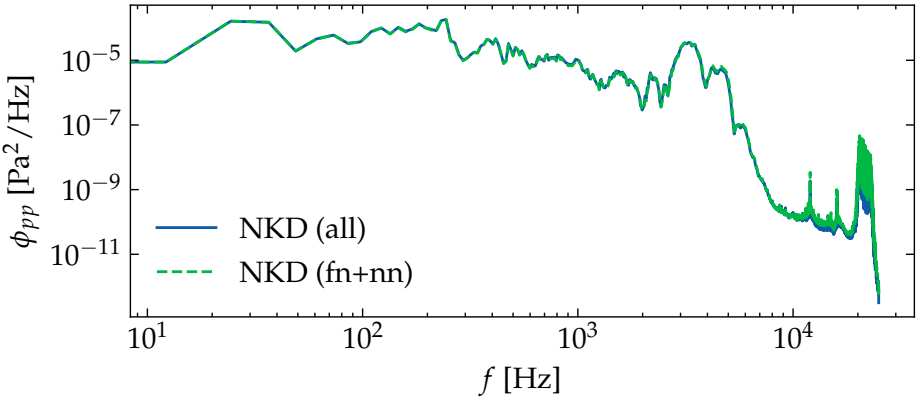
The calibration noise adds up



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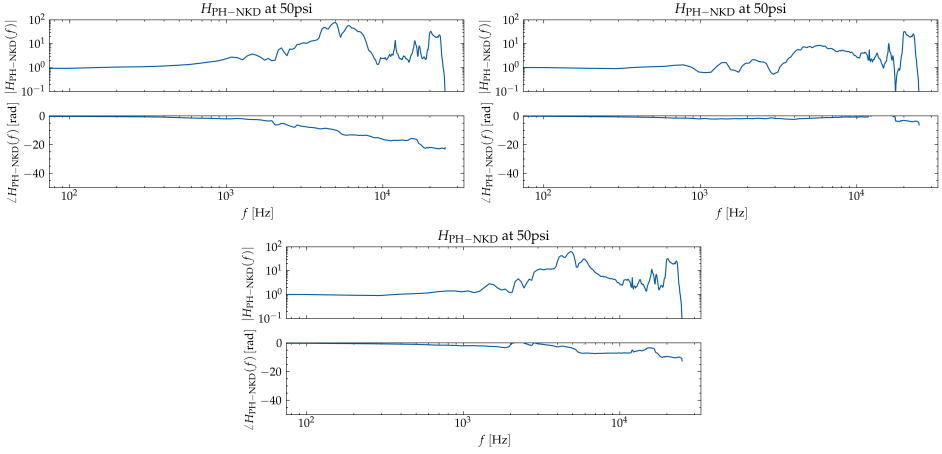
White noise is needed to highlight required TF



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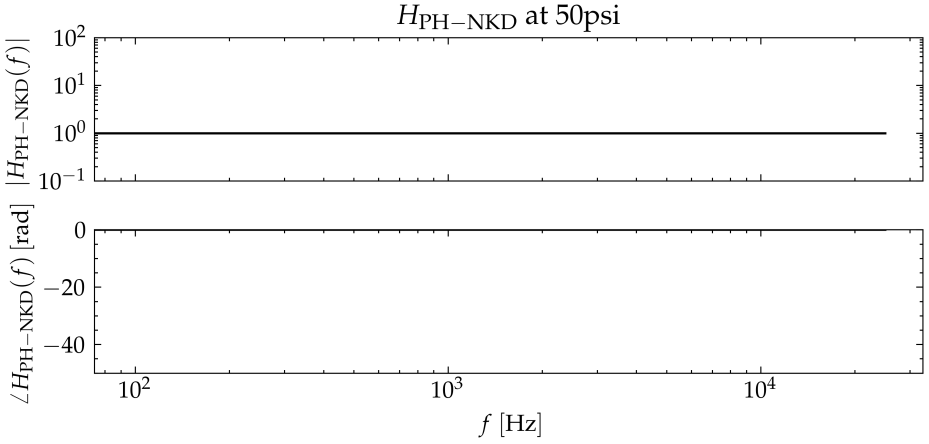
TF function between identical signals is 1



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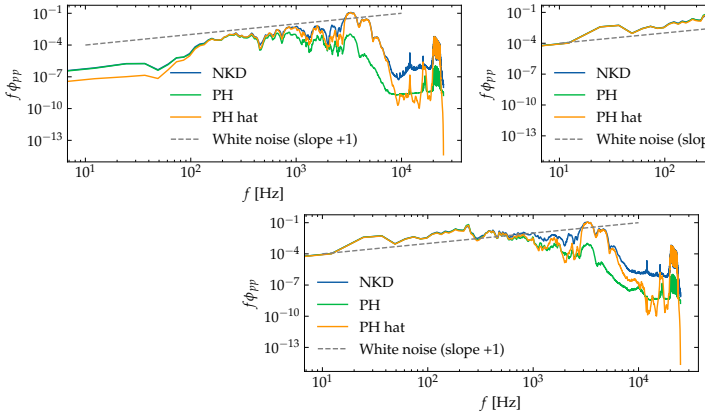
TF reconstructed spectra



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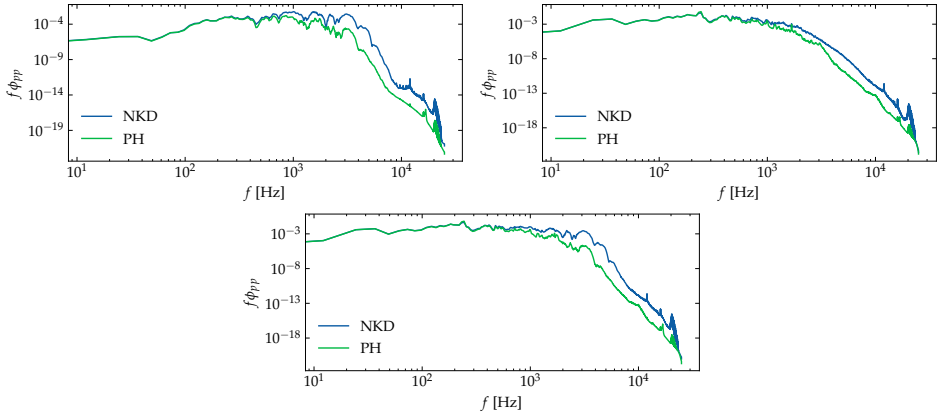
Spectra w. HP & LP filter

Filter at 0.1Hz and 2kHz corresponding to LP cutoff of $T^+ = 10$ at 50psi



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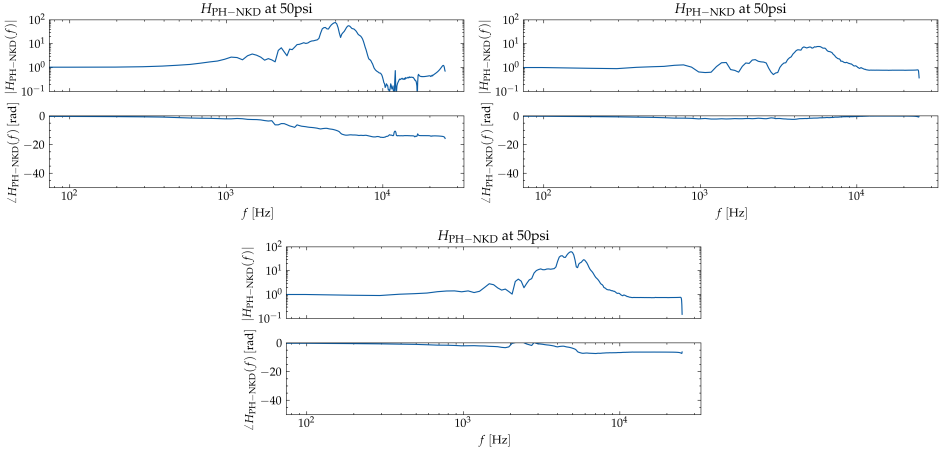
Do the TFs look reasonably similar after filtering?



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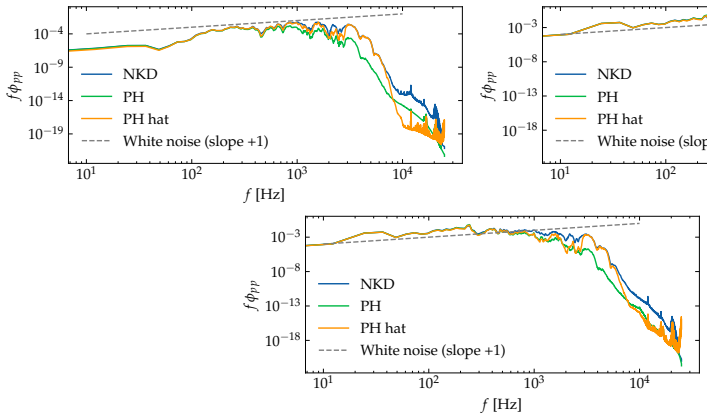
TF reconstructed spectra with HP & LP filter



There's no benefit of filtering the signals before calculating the TF

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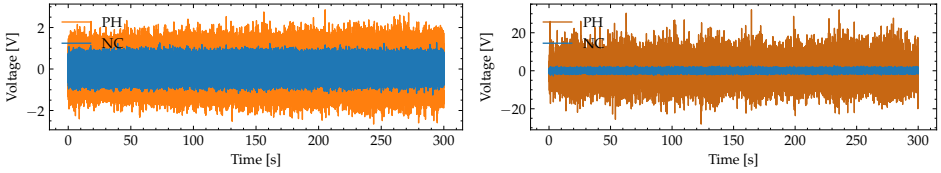
In-situ measurements at 50psi



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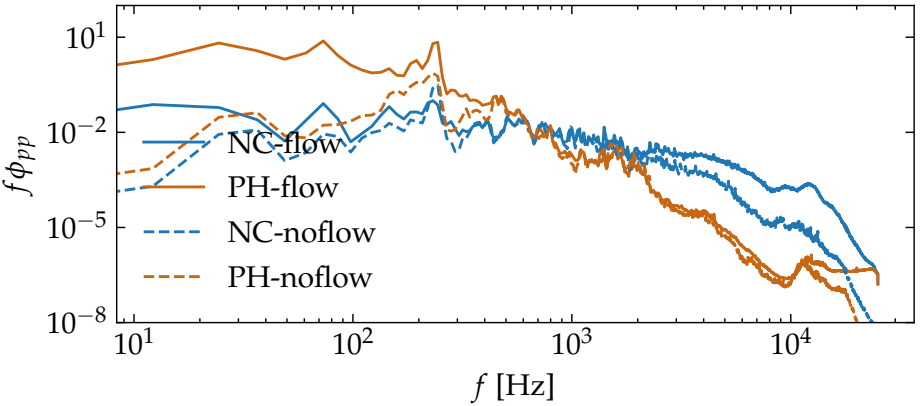
In-situ spectra at 50psi



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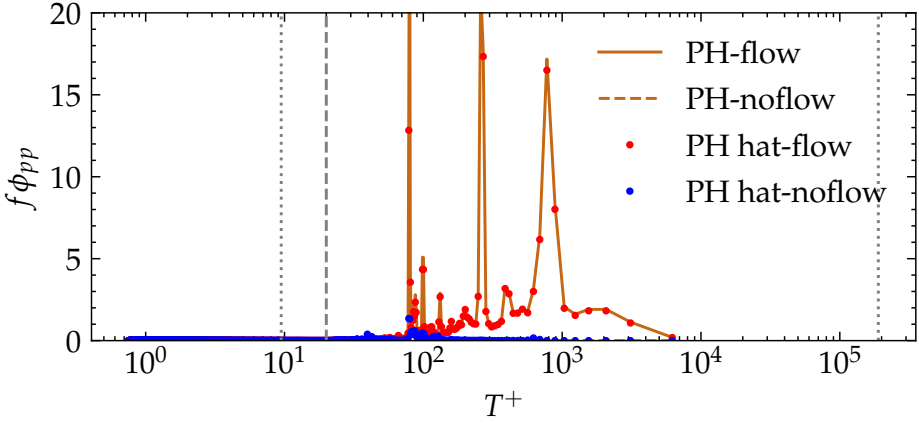
TF corrected spectra, no difference



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