

SU update:
We have two-point measurements with two streamwise spacings

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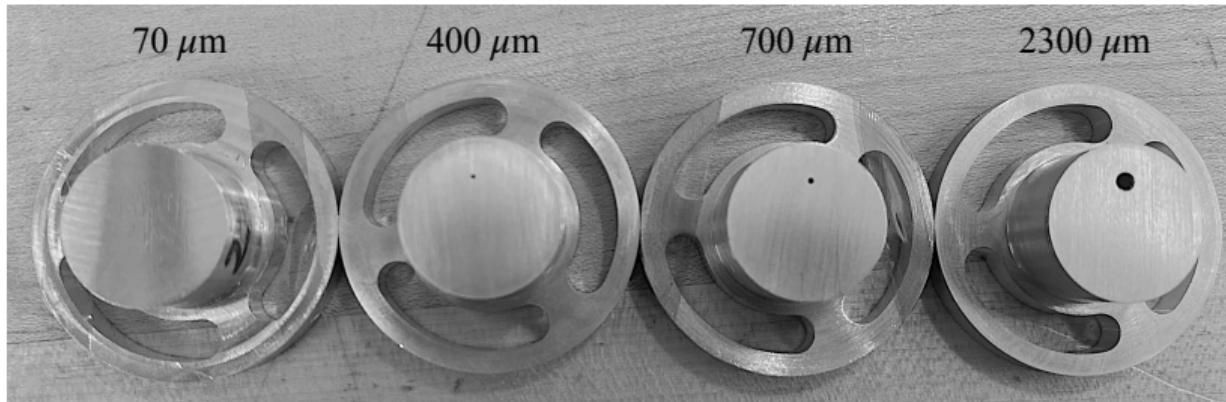
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Thanks to DARPA for funding this work.

- $\delta \approx 0.035[\text{m}]$, $U_e \approx 14[\text{m/s}]$, $T^+ \equiv Tu_\tau^2/\nu = 10$

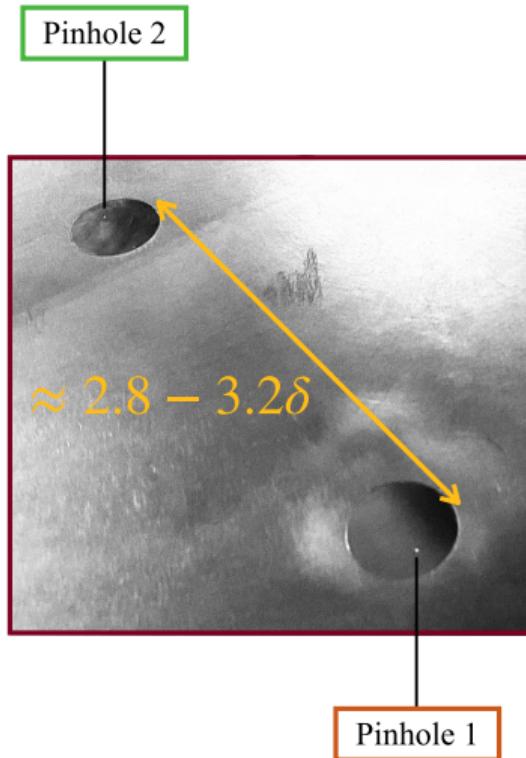
Pressure (psi)	0	50	100
$u_\tau [\text{m/s}]$	0.58	0.47	0.52
$\nu/u_\tau [\text{m}]$	27×10^{-6}	7.5×10^{-6}	3.7×10^{-6}
$\nu [\text{m}^2/\text{s}]$	15.7×10^{-6}	3.52×10^{-6}	1.92×10^{-6}
Re_τ	1,300	4,700	9,500
$f(T^+ = 10) [\text{Hz}]$	2,100	4,700	14,100

Pinhole diameters



- ▶ Testing pinhole diameters of $d = 2300, 700, 400 \mu\text{m}$
 - ▶ Corresponds to $d^+ \approx 85, 93, 108$
- ▶ Under the frozen turbulence assumption, these sit around $T^+ \sim 10$

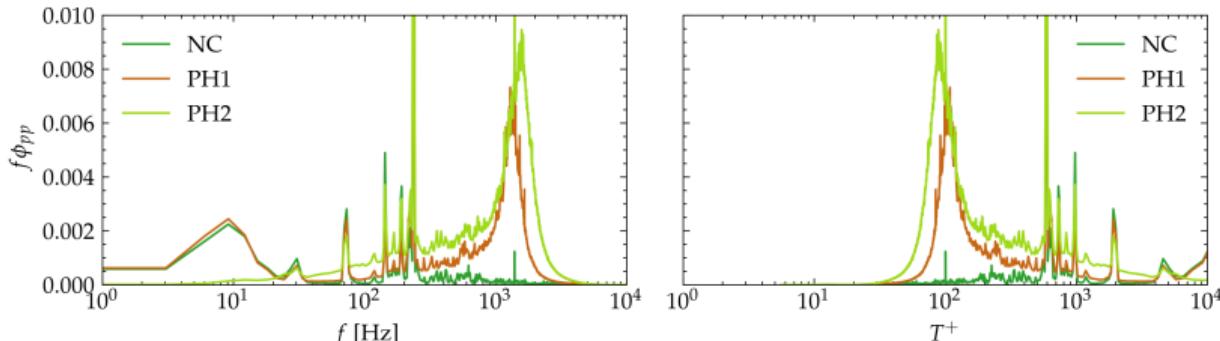
Pinhole spacings



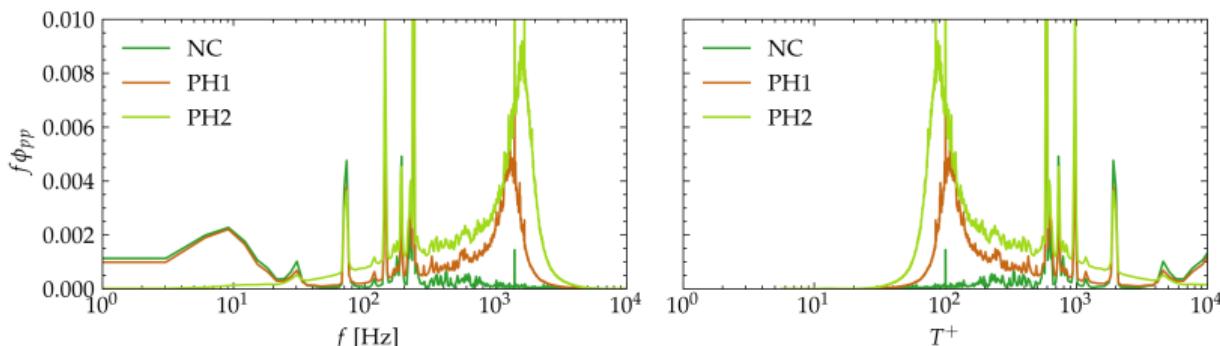
- ▶ We have two-point measurements at two streamwise spacings: 3.2δ and 2.8δ
- ▶ Herein, we refer to these as 'far' and 'close' spacings
- ▶ The spectra are plotted in voltage and haven't yet been converted to pressure

Raw Data: $Re_\tau \approx 9,500$ ($d = 700 \mu\text{m}$)

$Re_\tau \approx 9,500$ (700μm) - Far-spaced

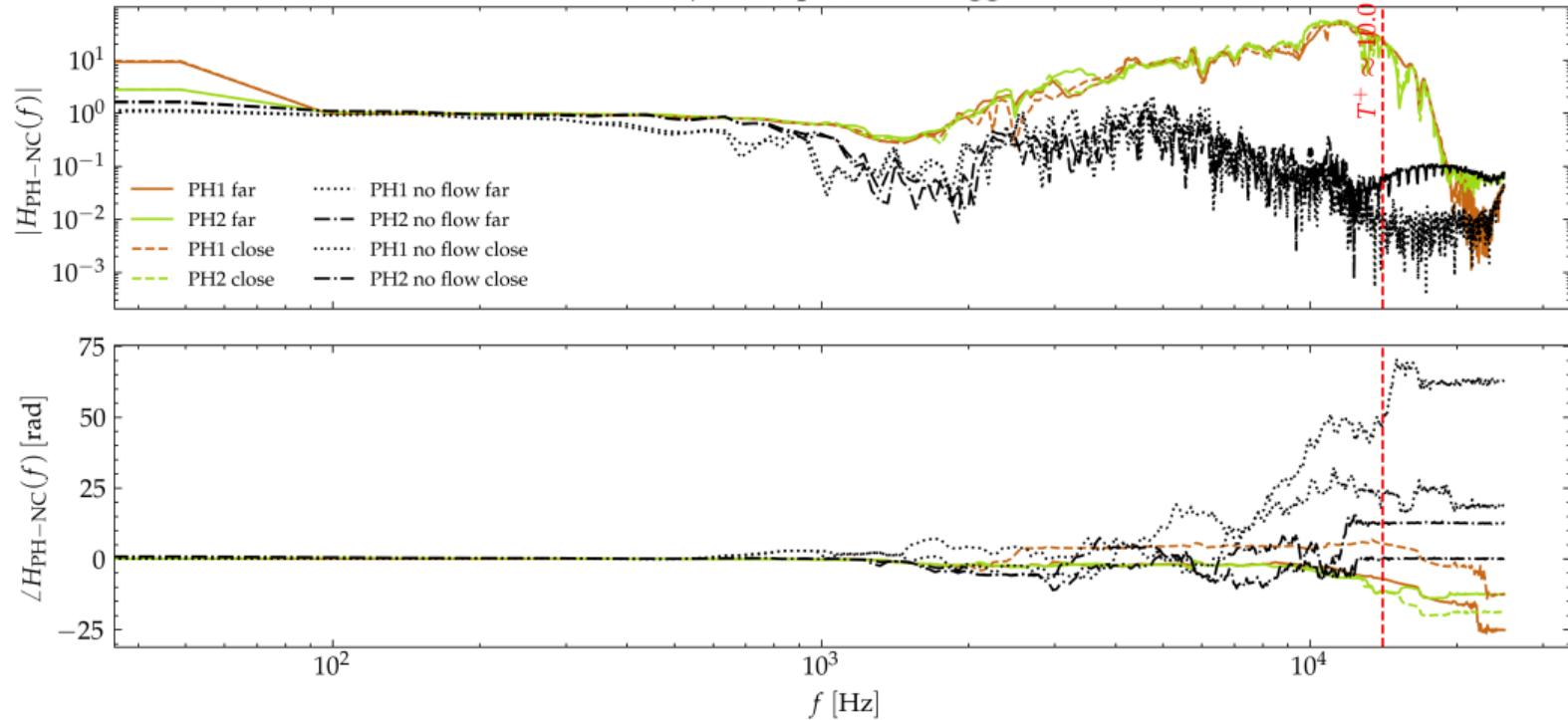


$Re_\tau \approx 9,500$ (700μm) - Close-spaced



Transfer Function: $Re_\tau \approx 9,500$ ($d = 700 \mu\text{m}$)

$H_{\text{PH-NC}} (700\mu\text{m}, 100\text{psi})$, with suggested cutoffs



Ongoing work on incorporating the 3 separate transfer functions

- ▶ The transfer functions appear to be similar, but not identical.
- ▶ Small discrepancies can lead to large differences in the final spectra
- ▶ We are working on methods to combine the 3 transfer functions into one robust estimate

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