

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

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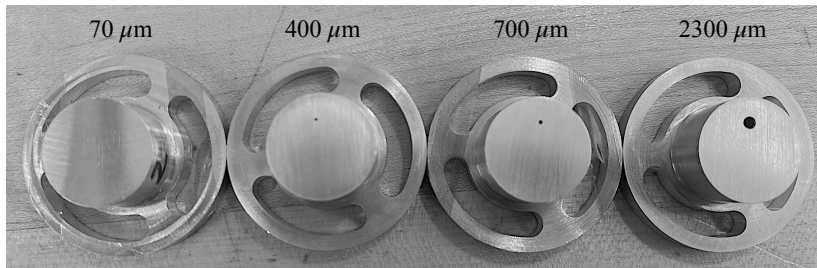
Center for Turbulence Research
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► $\delta \approx 0.035[\text{m}]$, $U_e \approx 14[\text{m/s}]$, $T^+ \equiv Tu_\tau^2/\nu = 10$

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



- ▶ 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 $T^+ \sim 10$

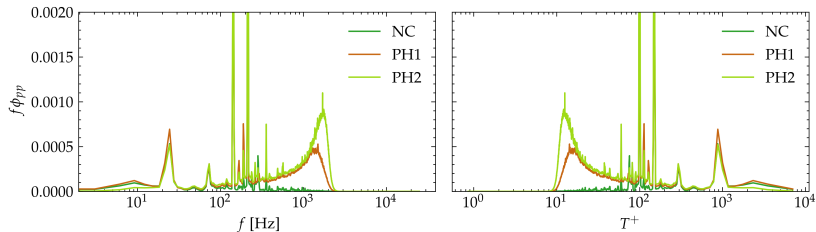
Picture of spaced pinholes

- ▶ 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

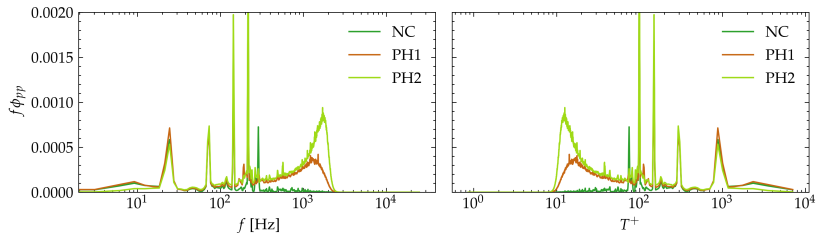
Raw Data

$$Re_\tau \approx 1,300 \ (d = 700 \ \mu\text{m})$$

$Re_\tau \approx 1,300 \ (700\mu\text{m})$ - Far-spaced

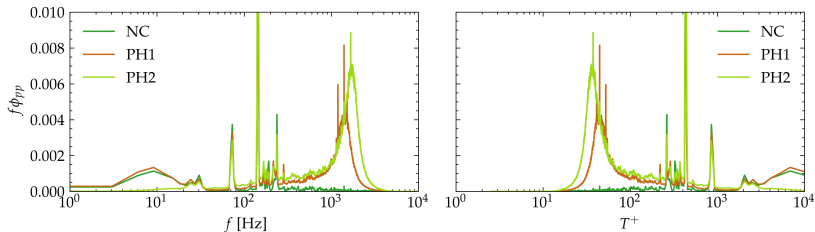


$Re_\tau \approx 1,300 \ (700\mu\text{m})$ - Close-spaced

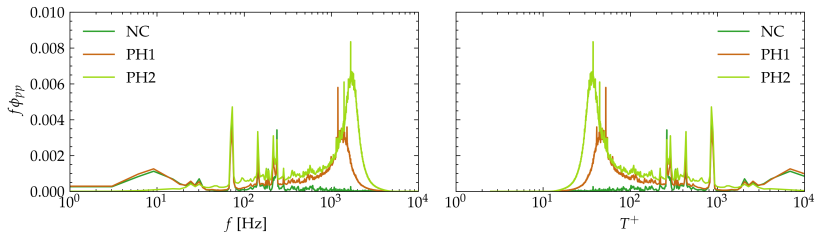


$$Re_\tau \approx 4,700 \ (d = 700 \ \mu\text{m})$$

$Re_\tau \approx 4,700 \ (700\mu\text{m})$ - Far-spaced

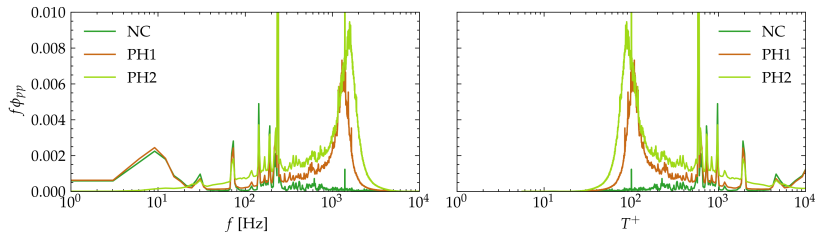


$Re_\tau \approx 4,700 \ (700\mu\text{m})$ - Close-spaced

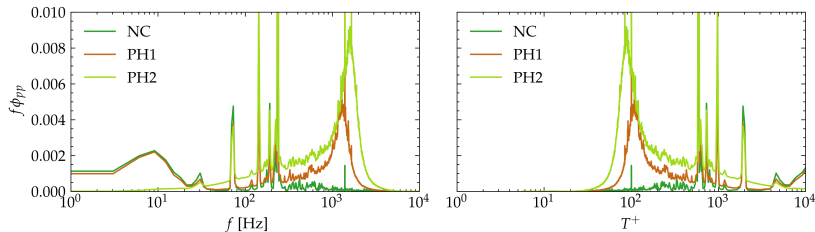


$$Re_\tau \approx 9,500 \ (d = 700 \ \mu\text{m})$$

$Re_\tau \approx 9,500 \ (700\mu\text{m})$ - Far-spaced



$Re_\tau \approx 9,500 \ (700\mu\text{m})$ - Close-spaced



Transfer Functions

- ▶ Received data last night
- ▶ Plotting transfer functions for cali1, cali2, and in-situ noflow now
- ▶ and incorporating into a single robust estimate, (will have if all goes well)

$$Re_\tau \approx 1,300 \ (d = 700 \ \mu\text{m})$$

$$Re_\tau \approx 4,700 \ (d = 700 \ \mu\text{m})$$

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

- ▶ 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