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Nano-scale thermal anemometry probe<sup>1</sup> MARCUS HULTMARK, JEFF HILL, SEAN BAILEY, GARY KUNKEL, CRAIG ARNOLD, ALEXANDER SMITS, Princeton University — A nano-scale thermal anemometry probe is being developed with high spatial and temporal resolution to measure small-scale turbulence in high Reynolds number flows. Manufactured using a combination of semiconductor and micro-electromechanical manufacturing processes, current models of the probe consist of a platinum sensing wire of length of  $60 \times 1 \times 0.1 \ \mu$ m suspended between two contact pads. Future versions of the probe will have their sensing length reduced, through the use of focused ion beam milling, to  $20 \times 0.1 \times 0.1 \ \mu$ m. Preliminary comparison has been made in a low turbulence free-stream between a conventional hot-wire probe and a nano-scale probe before reshaping of the supporting silicon substrate. Despite ~100  $\mu$ m of silicon protruding alongside of the free-standing wire, results showed that the two probes had similar static response with qualitatively higher frequency response observed for the nano-scale probe.

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