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**Measurement in a Hypersonic Turbulent Boundary Layer Using PIV** OWEN WILLIAMS, ALEXANDER SMITS, Princeton University — Experiments are reported on measuring turbulence in a flat plate boundary layer at Mach 7.4 using planar PIV in order to examine Morkovin's hypothesis and scaling at Mach numbers greater than 5. PIV measurements in hypersonic flow are hampered by high dynamic range requirements and low flow density, which leads to stringent particle sizing requirements to avoid particle lag. In addition, high shear can lead to a bias in many cross-correlation algorithms. Experiments to determine the frequency response of a range of titanium dioxide particles using the response across a shock will be detailed. Additionally, the conditions for the appropriate initial conditions for boundary layer development, such as the selection of size and type of tripping device and appropriate development length for the establishment of a fully turbulent boundary layer will be examined.

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