

Abstract Submitted
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Preliminary Results in an Ablation Wind Tunnel¹ MICHAEL ALLARD, CHRISTOPHER WHITE, University of New Hampshire, YVES DUBIEF, University of Vermont — We have constructed a small-scale boundary layer wind tunnel to study rapid turbulent ablation of a surface subjected to a heated flow to better understand the complex coupling between an erodible surface and an eroding agent. The test section of the tunnel is 303mm \times 141mm cross-section and 2.75m in length. The turbulence management section contains a 4:1 contraction, honeycomb, and 4 screens of decreasing mesh size. A 3/4HP fan is used to establish air flow in the tunnel and a frequency controller is used to control and maintain constant flow speed, which can be varied between 0.1 to 18m/s. A bank of electric heaters and a proportional integral derivative (PID) controller is used to maintain constant inlet air temperature. Characterization of the flow field over a non-ablative surface is reported, and qualitative observations of vortex induced erosion patterns on an ablative wall are presented.

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