

Abstract Submitted  
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**Self-sustained Shock Oscillations over Axisymmetric Bodies in Hypersonic Flow** VAISAKH SASIDHARAN, SUBRAHMANYAM DUVVURI, Indian Institute of Science — The phenomenon of shock oscillations over conical bodies with a blunt axisymmetric base has been investigated experimentally at Mach 6. The experiments were carried out in the 0.5 m diameter enclosed free-jet hypersonic wind tunnel at IISc; this facility can achieve a unit Reynolds number of  $9 \times 10^6 \text{ m}^{-1}$  at Mach 6. The axisymmetric test models consist of a base circular cylinder with a  $25^\circ$  half-angle conical forebody that is 40 mm in length ( $L$ ). The base diameter ( $D$ ) was varied to obtain different  $L/D$  ratios in the range 0.4 to 0.9 to study the effects of the geometric parameter on the oscillation dynamics. Time-resolved schlieren imagery from these experiments shows distinct “pulsation” and “oscillation” modes of shock oscillations, similar to previous observations from literature on spiked forebodies (the terminology for modes is borrowed from the same). The “pulsation mode” is seen at low  $L/D$  ratios, and a switch to “oscillation mode” occurs above a  $L/D$  ratio of 0.8. Detailed experimental results including an analysis of the different stages of shock oscillations will be presented at the meeting.

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