Optical Diagnostics for High-Speed/ Reacting Flows

Tuesday, February 4, 2013, 3:30P.M.

Lower Level Auditorium, Geddes Hall

Refreshments served at 3:00 p.m. in the Geddes Hall Coffee House

With novel application of optical techniques, the slender-body hypervelocity boundary-layer instability is characterized in the previously unexplored regime where thermo-chemical effects are important. Narrowband disturbances (500-3000~kHz) are measured in boundary layers with edge velocities of up to 5 km/s at two points along a generator of a 5 degree half-angle cone. Experimental amplification factor spectra are presented. Linear stability and PSE analysis is performed, with fair prediction of the frequency content of the disturbances. The results of this work have two key implications: 1) the acoustic instability is present and may be studied in a large-scale hypervelocity reflected-shock tunnel, and 2) the new data set provides a new basis on which the instability can be studied.

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If you are interested in meeting individually with Dr. Parziale, please contact Linda at 631-5431.