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Nitric Oxide Spectroscopic Measurements of a Shock-Boundary Layer Interaction in Hypervelocity Flow NELSON YANES, JOANNA AUSTIN, California Institute of Technology — Spatially resolved emission spectra are collected in the post bow shock and reattachment shock region of hypervelocity flow over a double wedge. The Hypervelocity Expansion Tube (HET) is used to generate high Mach number, high enthalpy flow (M = 7, h_0 = 8 MJ/kg) over a 30-55 degree double wedge. The NO γ band ($A^2\Sigma^+ - X^2\Pi$) emission is measured in the UV range of 210-250 nm. Detector exposures occur at select times throughout the flow development process to study temporal changes in thermal and chemical non-equilibrium. Profiles of vibrational band intensity and spectra as a function of distance are provided. Through a fitting procedure, the experimental spectra are matched with synthetic spectra to obtain an estimate of the excitation temperature of the NO molecule. The result is a temperature profile of the post-shock NO* with downstream distance.

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