

Abstract Submitted  
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**Experimental measurements of a non-equilibrium thermal boundary layer flow** DRUMMOND BILES, ALIREZA EBADI, Student, CHRIS WHIE, Professor — Data from a newly constructed non-equilibrium and thermal boundary layer wind tunnel is presented. The bottom wall of the tunnel is a sectioned-wall design composed of twelve aluminum 6061 plates with resistive heaters adhered to their underside. Each section is heated and controlled using independent feedback loop controllers. The freestream temperature is controlled by an upstream array of resistive heaters and a feedback controller. Experimental data with strong perturbations that produce non-equilibrium boundary layer flow behaviors is presented. Data for ZPG conditions are provided for validation purposes, and the effects of non-equilibrium behaviors on the transport of momentum and heat are discussed.

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