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Control of a heated high Reynolds number jet using plasma actuators[1] MARTIN KEARNEY-FISCHER, JIN-HWA KIM, MO SAMIMY[2], Mechanical Engineering - Ohio State University, GAS DYNAMICS AND TURBULENCE LABORATORY TEAM — Recent developments in the heating capabilities of the free jet facility at the Ohio State University's Gas Dynamics and Turbulence Laboratory using a storage-based off-line electric heater have made it possible to test the effectiveness of the localized arc filament plasma actuators (LAFPAs) over a wide range of temperatures. These actuators have been used successfully to control high Reynolds number, high-speed unheated jets. Characteristics of this jet with heating capabilities show consistency with previously published results in both far-field acoustics as well as jet centerline velocity and turbulent kinetic energy. Initial experiments show that LAFPAs can consistently produce significant mixing enhancement. Across the range of temperatures collected, the control authority of LAFPAs improves as temperature increases. Further experimental results exploring the behavior of LAFPAs will be presented, attempting to focus on the potential of the system for mixing enhancement and noise mitigation.

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