Abstract Submitted for the DFD07 Meeting of The American Physical Society

Operating Characteristics of a Fluidic Premixed Dump Combustor¹ KAREEM AHMED, ZAKERY CARR, DAVID FORLITI, State University of New York at Buffalo — A transverse slot jet issuing into a channel flow has been shown to develop a large-scale recirculation zone. The current work involves both reacting and nonreacting flow studies of a fluidic dump combustor that utilizes a transverse slot jet in a planar channel flow. The motivation is to develop low thrust penalty flame holding methodologies that increase thrust and improve fuel economy. The reacting flow studies addressed the stabilization limits and combustion phenomena observed for the fluidic dump combustor. The fluidic stream consists of a mixture of methane fuel and air at an equivalence ratio matching that of the main combustor flow. A wall-mounted V-gutter was also studied to provide a comparison to a more traditional flame holder. The fluidic dump combustor has slightly degraded stabilization performance in terms of lean and rich blowout limits compared to the V-gutter. It also observed both stable and oscillatory combustion at different operating conditions. The combustion efficiency is higher for the fluidic dump combustor. The effect of the size of the slot jet was also explored.

¹Supported by ONR contract N00014-06-1-0498.

Kareem Ahmed State University of New York at Buffalo

Date submitted: 03 Aug 2007

Electronic form version 1.4