Abstract Submitted for the DFD07 Meeting of The American Physical Society

Observations on Lifted Flame Oscillations and Flame Stability Near Blowout¹ NANCY MOORE, KEVIN LYONS, North Carolina State University — Studies are presented that examine the fluctuations in liftoff height of lifted flames in the presence of air co-flow. At a certain jet exit velocity, a flame will lift from the fuel nozzle and stabilize at some downstream position. The partially-premixed flame front of the lifted flame oscillates in the axial direction, with the oscillations becoming greater in flames stabilized further downstream. These oscillations are also observed in flames where blowout is imminent. This work attempts to determine the role of fuel velocity and air co-flow on flame oscillations in both stable and unstable regimes. The results of video imaging of a lifted methane-air diffusion flame are presented. Images are used to ascertain the changes in the reaction zone that influence these oscillations and relate the movement to blowout.

¹The research reported in this paper has been supported by the U. S. Army Research Office (Contract W911NF0510045).

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Date submitted: 03 Aug 2007

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