Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Numerical study on the stabilization of ball-like reacting fronts at normal gravity[1] FRANCISCO HERNANDEZ PEREZ, King Abdullah University of Science and Technology, ZHEN ZHOU, YURIY SHOSHIN, JEROEN VAN OIJEN, PHILIP DE GOEY, Eindhoven University of Technology, HONG IM, King Abdullah University of Science and Technology — A computational investigation on the stabilization and dynamics of lean premixed flames in tubes at near lean-limit conditions is conducted. Hydrogen-methane-air premixed mixtures are considered in tubes with two different diameters (13.5 and 55 mm) and under the influence of normal gravity. As the lean flammability limit is approached, individual (13.5 mm tube) and multiple (55 mm) ball-like flames are formed and stabilized. Through high-fidelity simulations with detailed transport and chemical models as well as the inclusion of heat losses, the stabilization and dynamics of such flames are examined.

[1]The support from KAUST, the KAUST Supercomputing Laboratory and the Dutch Technology Foundation (STW) are gratefully acknowledged

Francisco Hernandez Perez
King Abdullah University of Science and Technology

Date submitted: 01 Aug 2019 Electronic form version 1.4