Supplementary Information

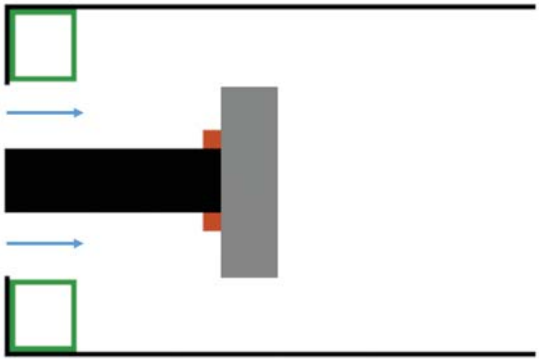

Figure S1. Schematic of the entry section of the turbulent combustor. The blue arrows show the direction of the bulk flow of the reactants into the rectangular duct. This combustor contains a bluff body to stabilize the flame. The bluff body, denoted by the grey surface is supported by a shaft, denoted by a black color. Fluid flows around the bluff body. This results in stagnation points illustrated using orange color at the corner between the shaft and the bluff body. Inlet conditions also result in a recirculation zone at the corner of the rectangular duct. Green squares represent the location of these recirculation zones. The turbulent combustor that we utilize is a backward-facing step combustor. The rectangular duct of the combustor has a cross section of 90×90 mm^2 and a total length of 1100 mm. As a result of the backward facing step at the inlet, a recirculation zones form at the corners. The fuel, which is a mixture of propane and butane is injected and mixes with air 120 mm upstream of the bluff body. As a result, we obtain a partially premixed flame.

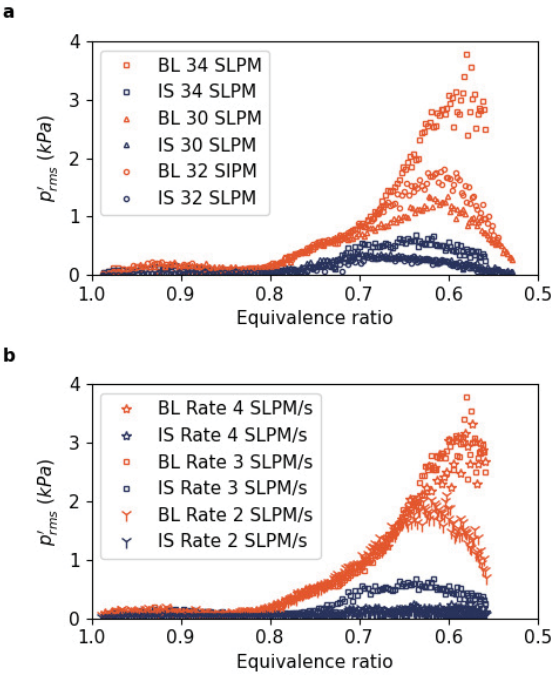

Figure S2. p'_{rms} for BL and IS bluff bodies at different operating conditions. **a** p'_{rms} for different $\dot{m}_{fuel}$: 30 SLPM, 32 SLPM and 34 SLPM at the same increase in air flow rate of 3 SLPM/s. For various $\dot{m}_{fuel}$ that we have utilized, the suppression of the onset of thermoacoustic instability occurs for the IS bluff body. As $\dot{m}_{fuel}$ increases, there is greater suppression of the pressure oscillations if we compare the maximum amplitudes of pressure oscillations obtained for each experiment. **b** p'_{rms} for different rate of increase of $\dot{m}_{air}$ 2 SLPM/s, 3 SLPM/s and 4 SLPM/s at the same $\dot{m}_{fuel}$ 34 SLPM. In these cases as well, we observe suppression for all the experiments with the IS bluff body.