

Supplementary Material

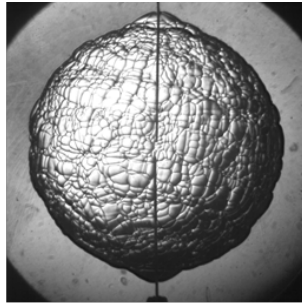
Role of Darrieus-Landau Instability in Propagation of Expanding Turbulent Flames

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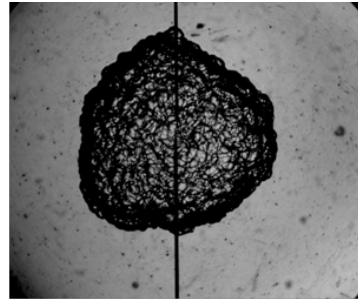
1. High speed images of laminar and turbulent flames

In this section, we show the morphologies of DL cellular instability affected laminar and turbulent flames at three different regimes of interaction.

a) DL Instability Dominated Regime

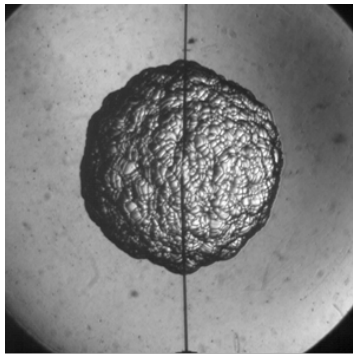


**Laminar, Cellularly
Unstable Flame**

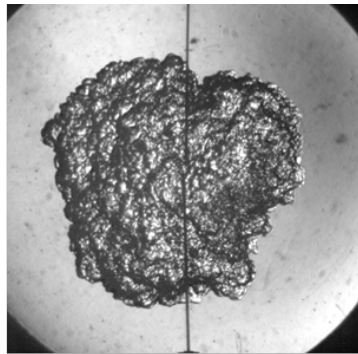


Turbulent Flame

b) Instability and Turbulence Interaction Regime

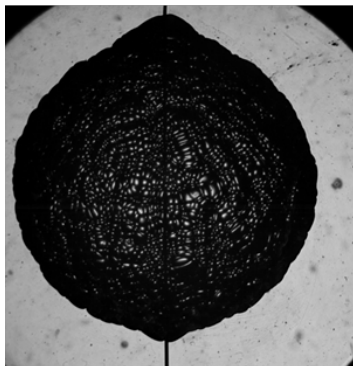


**Laminar, Cellularly
Unstable Flame**

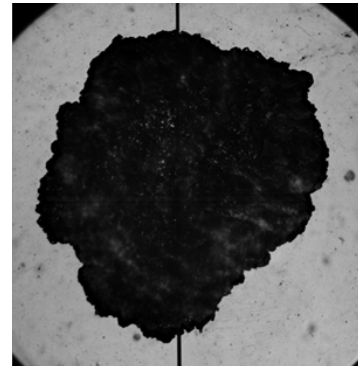


Turbulent Flame

c) Turbulence Dominated Regime



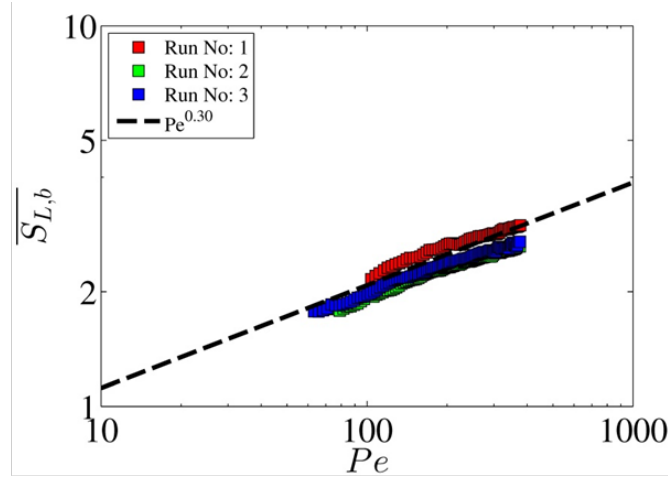
**Laminar, Cellularly
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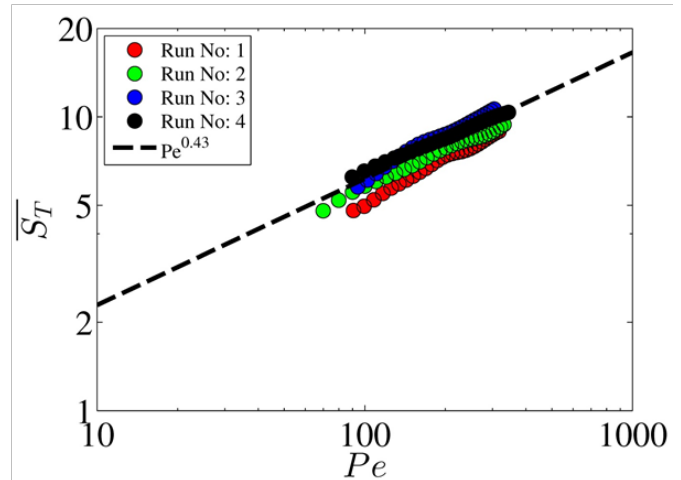
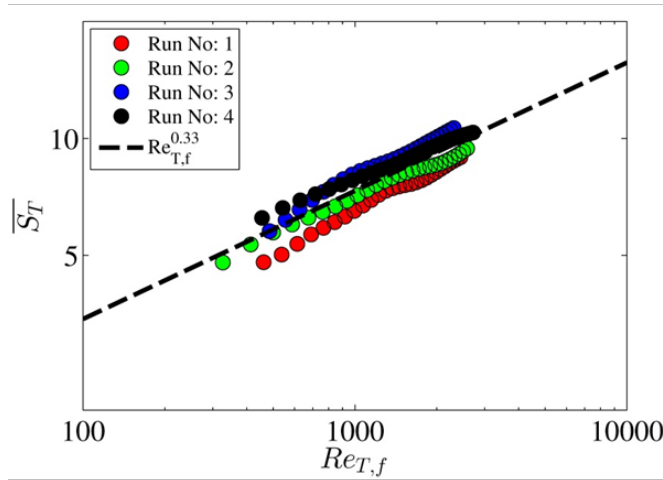
Turbulent Flame

2. Multiple runs of the same experimental condition

In this section, we compare the flame speed data from multiple experimental runs conducted at same condition to highlight the run to run variations. As shown in the plots below, the run to run variations are minimal. The acceleration exponents (or slope of the lines) calculated from individual experiments show maximum 4% variation for laminar flames and maximum 9% variation for turbulent flames.



Cellularly unstable laminar flame:
 $H_2/O_2/N_2$ mixture, $\phi=1.0$, $T_f=1800K$, $P=10$ atm



Turbulent flame:
 $H_2/O_2/N_2$ mixture, $\phi=1.0$, $T_f=1800K$, $P=10$ atm, fan speed=3000rpm