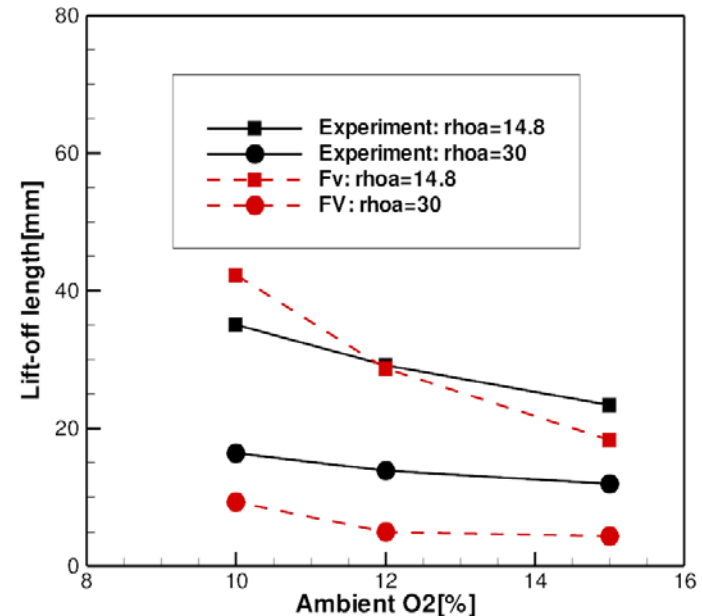
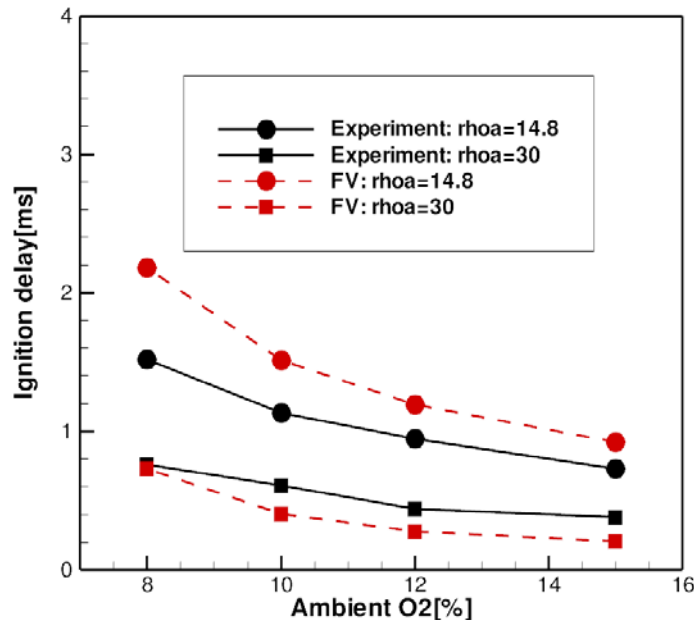


Some global trends can be reproduced using models that neglect turbulent fluctuations in composition and temperature.



H. Zhang

29-species n-heptane mechanism

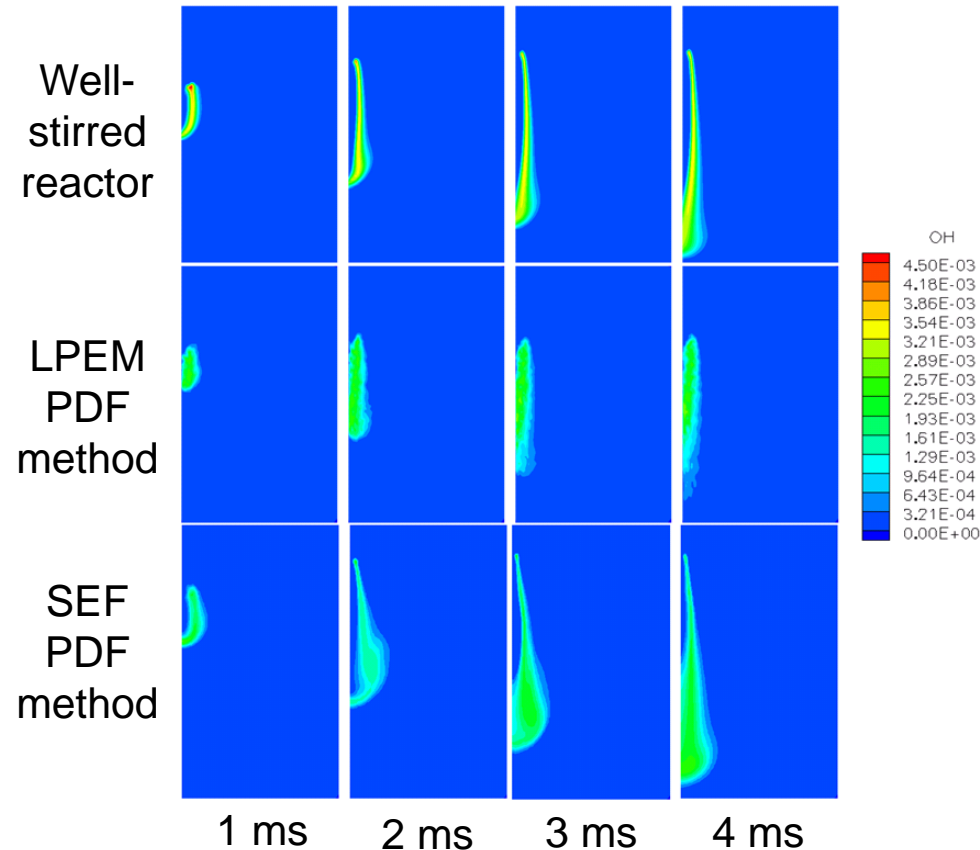
PENNSSTATE



Department of Mechanical & Nuclear Engineering
The Pennsylvania State University

However:

- Computed liftoff lengths change by up to ~50% with consideration of fluctuations.
- The turbulent flame structure is qualitatively incorrect when fluctuations are neglected.



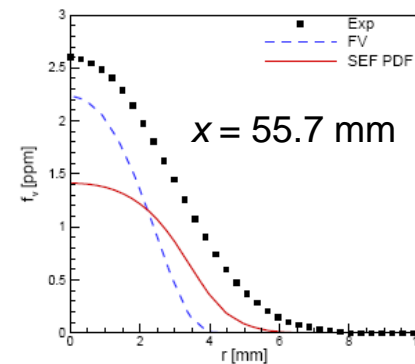
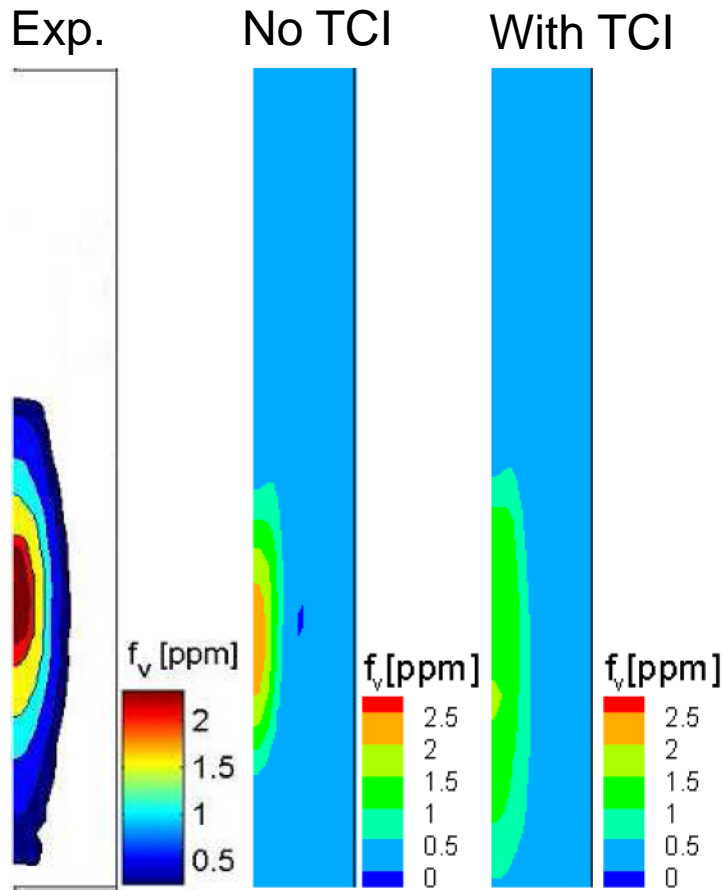
Bhattacharjee et al.,
ESSCI, Storrs, CT, Oct. 2011

PENNSSTATE

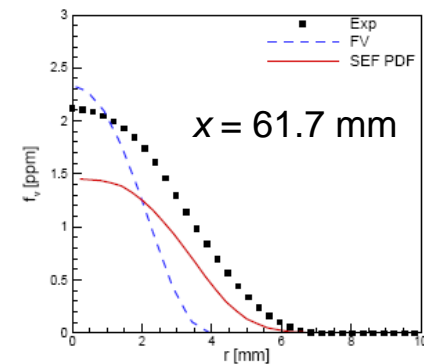


Department of Mechanical & Nuclear Engineering
The Pennsylvania State University

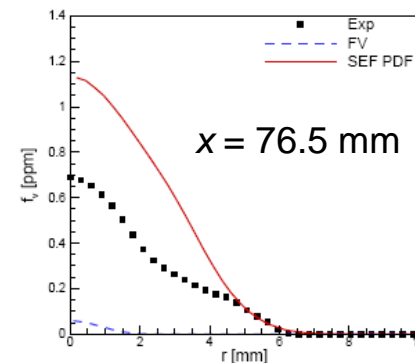
Computed soot levels and distributions change significantly when fluctuations are considered.



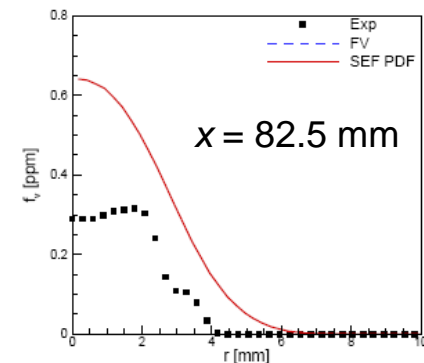
(a)



(b)



(c)



(d)

Total computed soot mass is >2x higher with TCI.

J. Jaishree, 34-species n-heptane + 2-equation soot

PENNSSTATE



Department of Mechanical & Nuclear Engineering
The Pennsylvania State University