Journal of Combustion

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Special Issue on

# The Role of Injector Flow and Spray Development on Combustion Characteristics

CALL FOR PAPERS

The internal injector flow and subsequent spray evolution are of prime significance especially when the combustion phenomenon is involved. The industrial aspect of spray combustion is in spotlight due to its widespread applicability in internal combustion engines, boilers, rockets, jet engines, industrial furnaces, and power plants prime mover. The flow dynamics are under the influence of cavitation and two-phase flow regime, such that the physical attributes of turbulence, viscosity, and velocity will determine the quality of spray breakup. A good quality spray is characterized with homogenous droplet dispersion through oxidizer, which ensures stoichiometric combustion leaving minimum level of hazardous emissions, particularly unburned hydrocarbons (UHCs). This will be achieved by longer penetration, smaller droplet diameter (SMD), and bigger spray cone angle. The improvement which is fuel spraying would definitely bring about elevated power generation as well as considerable reform in fuel economy.

Different fuels have disparate physiochemical specifications, which make each one distinctive in terms of evaporation, liquid surface tension/perturbation, turbulent fluctuation, and aerodynamic pressure. Due to these dynamic effects, various surrogate fuels demonstrate individual characteristics in spray atomization criteria. There is a high capacity of research taking into account the alternative fuels especially those being in the center of attention such as biofuels showing interesting liquid jet disintegration trends. Moreover, injector design, structure modification, and optimization are another dynamic fields of research in spray formation; among them convergent-divergent, group hole, and spiral rifling nozzles can be named as few proposed designs to control and ameliorate the spray behavior. On the other side, spray heating and combustion process is critically noteworthy, since the premixed combustion is primarily dependent on air-fuel droplet mixture. We welcome investigators to contribute their original research articles.

Potential topics include but are not limited to the following:

- Multiphase flow and cavitation initiation inside nozzle
- Use of renewable or surrogate fuels in injector
- CFD simulation of the state-of-the-art nozzle configuration
- Experimental observation of spray development
- Analytical approaches to measure transient spray dimension
- Hydrodynamic and aerodynamic considerations of spray breakup
- Spray combustion in internal combustion engines (ICEs)
- RANS/LES/DNS simulation of diesel sprays

A particular attention will be paid to researches dedicated on design and optimization of a novel injector structure. Meanwhile, utilization of renewable biobased fuels, synthesized blended fuels, and emerging technologies concerned with the modeling of spray injection is also invited. Contributions dealing with the experimental techniques in spray observations such as PDPA, PLIEF, and X-ray phase-contrast imaging have a high chance of acceptance in the proposed special issue.

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/jc/ifsd/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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