

Experimental Optimization of Swirl Fuel Injector in Gas Turbine Engines

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Abstract—*The influences of injection conditions and recess configurations of liquid swirl injector on the spray characteristics were investigated. It is revealed that the interaction between two conical liquid sheets has considerable influence on the spray characteristics. The spray characteristics like as spray angle and breakup length were determined to be close to the side having larger momentum between inner and outer spray. Also, it is known that the recess can augment mixing efficiency and flame stabilization through the internal mixing of propellants. In the internal mixing injection region, spray angle and breakup length increase with increase of recess length, and which can be explained by the formation and decay of wave inside the recess region. As the recess length increases, the mean drop size increases due to the increase of effective film thickness and the decrease of spray angle.*

Keywords: *Injector, Spray Cone angle, Flame, Spray angle, Swirl injector.*