

Effect of Different Diesel Fuels on Formation of the Cavitation Phenomena

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Abstract : Cavitation inside the diesel injector nozzle is investigated numerically in this study. Reynolds Stress Navier Stokes set of equations (RANS) are utilized to investigate flow behavior inside the nozzle numerically. Moreover, K- ϵ turbulent model is found to be a better approach comparing to K- ω turbulent model. Winklhofer rectangular shape nozzle is also simulated in order to verify the current numerical scheme, and with, mass flow rate approach, the current solution is verified. Afterward, a six-hole real-size nozzle was simulated, and it was found that among different fuels used in this study with the same condition, diesel fuel provides the largest length of cavitation. Also, it was found that at the same boundary condition, RME fuel leads to the highest value of discharge coefficient and mass flow rate.

Keywords : cavitation, diesel fuel, CFD, real size nozzle, discharge coefficient

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