

Numerical Modeling the Cavitating Flow in Injection Nozzle Holes

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Abstract : Cavitating flows inside a diesel injection nozzle hole were simulated using a mixture model. A 2D numerical model is proposed in this paper to simulate steady cavitating flows. The Reynolds-averaged Navier-Stokes equations are solved for the liquid and vapor mixture, which is considered as a single fluid with variable density which is expressed as function of the vapor volume fraction. The closure of this variable is provided by the transport equation with a source term TEM. The processes of evaporation and condensation are governed by changes in pressure within the flow. The source term is implanted in the CFD code ANSYS CFX. The influence of numerical and physical parameters is presented in details. The numerical simulations are in good agreement with the experimental data for steady flow.

Keywords : cavitation, injection nozzle, numerical simulation, k- ω

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