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# Numerical Investigation of Lagrangian Single-Component Liquid Film Evaporation models

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**Abstract**

Liquid film evaporation from solid surfaces is of relevance to many engineering problems such as piston and turbine engines, exhaust system and even in spray cooling. In this study, a turbulent channel configuration with hot gas flow and liquid film on the lower wall has been investigated in order to study the effects of wall temperature, ambient gas temperature and turbulence on the evaporation of the liquid film. Two Lagrangian single-component liquid film evaporation models developed by O'Rourke and Amsden [1] (OA) and by Desoutter et al. [2] (GD), already implemented in the Reynolds Average Navier-Stokes (RANS) code IFP-C3D [3], have been applied to the channel configuration. The results of the study show that, in both Lagrangian liquid film models of OA and GD, the increase in the turbulence intensity, ambient gas and wall temperatures help to increase the liquid film evaporation. In addition, the comparison of the numerical results has shown a faster liquid film evaporation using the GD model.

Keyword: Liquid film evaporation; wall temperature; turbulence; Single-component model

**References**

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