Abstract

Film cooling is a very important gas-turbine application that is used to cool its typical hot components. This study on a flat plate with secondary stream flowing through a slot focuses the analysis of heat transfer along the plate surface.

Problem Statement

Conduct the simulation with secondary injection angle 35^0. Use the steady state solver *buoyantSimpleFoam* for incompressible flow. Since plate surface is the important region of this analysis, make the mesh fine near the plate.

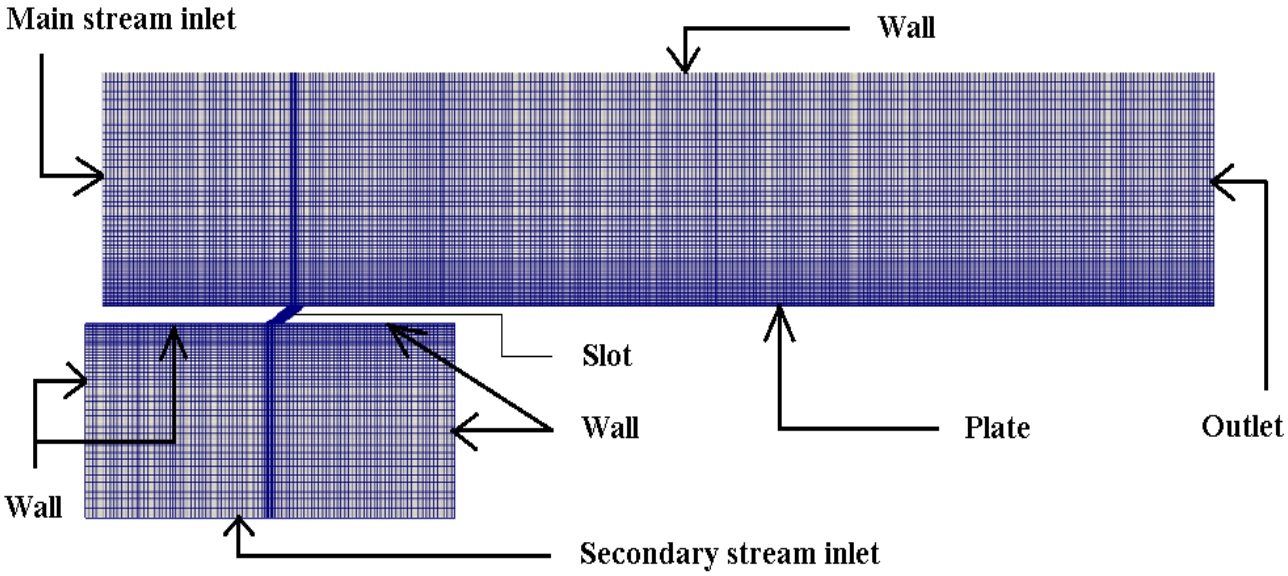

Fig.1. 2D domain with mesh

Fluid properties and initial parameters:

ρ_{fluid} = 1.225 kg/m^3

mu = 1.831e-05 Pa.sec

C_p = 1004.4 J/kgK

T_{fluid} = 300K

T_α = 300K

$q^{//}$ = 1000 W/m^2

M = 1

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