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Numerical Investigations of a Wall Jet with Tabs HAMID RAHAI[1], CARLOS ORRALA[2], HUY HOANG[3], CEERS/CSULB — Numerical investigations of a wall jet with tabs were performed. The tabs were rectangular thin metal plates placed at the jet outlet, either at the top mid boundary, or at the mid-sections of the three unbounded boundaries, perturbing into the jet. The analyses were carried out at a maximum mean velocity of 15 m/sec., which corresponds to an approximate jet Reynolds number based on the vertical jet dimension of 13027. The numerical calculations were performed using the Reynolds-Averaged Navier-Stokes equations with the Wilcox K-ω turbulence model. Results that include axial and spanwise variations of the mean velocity, velocity vector, turbulent kinetic energy and vorticity at different axial locations show that with a single tab, the spanwise entrainment is enhanced while with the three tabs, both the vertical and spanwise entrainments are increased. The increase in the spanwise entrainment should result in enhanced film cooling applications.

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