CURRICULUM VITAE

Name: Sushil Kumar Rathore

Educational Qualification:

Degree	University/College	Year of passing	CGPA
Doctor of Philosophy	Indian Institute of Technology Kharagpur	Thesis submitted on 27-02-2015	-
Master of Technology	Indian Institute of Technology Kharagpur	2009	8.62 out of 10
Bachelor of Engineering	Government Engineering College Bilaspur	2007	8.17 out of 10

List of publications

Journals

- Rathore, S. K., Das, M. K., 2013. Comparison of two low-Reynolds number turbulence models for fluid flow study of wall bounded jets. International Journal of Heat and Mass Transfer 61, 365–380.

- Rathore, S. K., Das, M. K., 2015. A comparative study of heat transfer characteristics of wall-bounded jets using various turbulence models. International Journal of Thermal Sciences 89, 337-356.

- Rathore, S. K., Das, M. K., 2015. Investigation on the relative performance of various low-Reynolds number turbulence models for buoyancy-driven flow in a tall cavity. Heat and Mass Transfer, Published online 18 April 2015, DOI 10.1007/s00231-015-1557-8.

- Rathore, S. K., Das, M. K., Effect of freestream motion on heat transfer characteristics of turbulent offset jet. Submitted to ASME Journal of Thermal Science and Engineering Applications (under review).

- Rathore, S. K., Das, M. K., Numerical investigation on the performance of low-Reynolds number $k-\epsilon$ model for a buoyancy-opposed wall jet flow. Submitted to International Journal of Heat and Mass Transfer (under review).

Conferences

- Rathore, S. K., Das, M. K., 2012. Low Reynolds number modeling of an offset jet. International Conference on Applications of Fluid Engineering, 20-22 September, 2012, G. L. Bajaj Institute of Technology & Management, Greater Noida.
- Rathore, S. K., Das, M. K., 2013. Effect of freestream motion on heat transfer characteristics of turbulent offset jet. Proceedings of the 22^{nd} National and 11^{th} International ISHMT-ASME Heat and Mass Transfer Conference, December 28-31, 2013, IIT Kharagpur, India.

Modeling procedure: â€¢ Determine relevant Reynolds number to estimate if the flow is turbulent â€¢ Select a turbulence model option and a near-wall treatment â€¢ Estimate the physical dimension of the first grid point off the wall (y+) â€¢ Generate the grid â€¢ Perform the simulation â€¢ â€œRealityâ€ check (experiments, literature, model consistency, grid resolution).Â Low-Re k-Îµ model. Development of a custom turbulence model can be accomplished using the UDFs. k-Îµ model with damping functions formulation: ME469B/3/GI. Overview of Computational Approaches. Â‹ Reynolds-Averaged Navier-Stokes (RANS) models. z Solve ensemble-averaged (or time-averaged) Navier-Stokes equations z All turbulent length scales are modeled in RANS. z The most widely used approach for calculating industrial flows.Â z Theoretically, all turbulent flows can be simulated by numerically solving the full Navier-Stokes equations.Â z The characteristic Reynolds number is low or if near wall characteristics need to be resolved. z The physics and near-wall mesh of the case is such that y+ is likely to vary significantly over a wide portion of the wall region. Â‹ Try to make the mesh either coarse or fine enough to avoid placing the wall-adjacent cells in the buffer layer (5 < y+ < 30). A new turbulence model for predicting fluid flow and heat transfer in separating and reattaching flows â€“ I: Flow field calculations. International Journal of Heat and Mass Transfer, 37, 139â€“151. ABID, R. 1993. Evaluation of two-equation turbulence models for predicting transitional flows.Â Computational study of high-lift low-pressure turbine cascade aerodynamics at low reynolds number. Journal of Propulsion and Power, 29, 446â€“459. ARNAL, D. 1992.Â A one-equation turbulence transport model for high Reynolds number wall-bounded flows, National Aeronautics and Space Administration, Ames Research Center. NASA Technical Memorandum No. 102847. Bardina, j., ferziger, j. & reynolds, w. 1980. Flows at two Reynolds numbers have been computed, one at 100,000 and the other at 36,000. In the heat transfer analysis, the Prandtl number was either 0.72 (air) or, in a further departure from our earlier studies, 5.9 (water). The turbulence modelling approaches examined, include a two-layer and a low-Re k-Îµ. model, a two-layer and a low-Re version of the basic differential stress model (DSM) and a more recently developed, realisable version of the differential stress model that is free of wall-parameters.Â also used these models in the computation of heat and fluid flow through stationary U-bends with encouraging results (see Nikas and Iacovides [6]). Reynolds number is a ratio of inertia force to viscous force. It is the key parameter in determining whether or not a flow is laminar or turbulent. It can be use to predict where transition will take place if Re < 2000 the flow is laminar if 2000 ...Â The water which is hitting that wall has nowhere to go, so it flows backwards, causing vortices, also known as eddies. Now, the fact that these eddies exist is a turbulent characteristic in of itself, but you can also think about it in terms of velocity: in the area of the vortice the fluid is flowing faster, which is why there might be turbulence in that particular area whereas the rest of the flow is laminar. 11. 1.Â The flow velocity profile for turbulent flow is fairly flat across the center section of a pipe and drops rapidly extremely close to the walls.