

**Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska (UZ3)
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Hybrid RANS/LES of flow and convective heat transfer

Abstract:

Fluid flow and convective heat transfer predictions are presented of round impinging jets for several combinations of nozzle-plate distances $H/D=2, 6$ and 13.5 (where D is the nozzle diameter at the jet exit) and Reynolds numbers $Re=5000, 23000$ and 70000 with the newest version of the k - ω model of Wilcox (2008) and three hybrid RANS/LES models. All hybrid RANS/LES models are able to correct the heat transfer overprediction of the RANS model. For good predictions at low nozzle-plate distance, it is necessary to sufficiently resolve the formation and development of the near-wall vortices in the jet impingement region. At high nozzle-plate distance, the essence is to capture the evolution and breakup of the flow unsteadiness in the shear layer of the jet, so that accurate mean and fluctuating velocity profiles are obtained in the impingement region. Although the models have a quite different theoretical justification and generate a quite different eddy viscosity in some flow regions, their overall results are very comparable. The reason is that in zones that are crucial for the results, the models behave similarly.

Serdecznie zapraszamy,
M. Dąbrowski, T. Kwiatkowski