

عنوان مقاله:

Influence of Near-Wall Region Models on Flow and Heat Transfer in Confined Impingement Jets

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خلاصه مقاله:

In the present paper, a three dimensional study of flow and heat transfer in eight rows of circular impingement jets is carried out numerically. For an array of confined impingement jets, the interaction between the crossflow and adjacent jets can deteriorate the heat transfer performance of the cooling jets. However, the confining walls of the impingement cavity have considerable influence on the flow and heat transfer pattern of the problem. Modeling of the near-wall region is performed using four different approaches, namely (a) two-layer zonal model, (b) low Reynolds number $k-\epsilon$ model, (c) non-equilibrium wall functions and (d) standard wall functions. The realizable $k-\epsilon$ turbulence model is employed together with cases (a), (c) and (d). The capability of the near-wall region models in predicting the heat transfer coefficient distribution on the hot target plate is investigated. The present results are compared with the available experimental data. Among all cases, the two-layer zonal model shows the most satisfactory performance

کلمات کلیدی:

near-wall region models, confined impingement jets, heat transfer coefficient, cross-flow

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