عنوان مقاله:

A Comparative Study of the Buoyancy-Opposed Wall Jet using Different Turbulent Models

محل انتشار:

تعداد صفحات اصل مقاله: 14

نویسندگان:

X. Nie - *School of Mechanical Engineering, Hangzhou Dianzi University, Hangzhou, Zhejiang, ۳۱۰۰۱۸, China*

Z. H. Zhu - *School of Mechanical Engineering, Hangzhou Dianzi University, Hangzhou, Zhejiang, ۳۱۰۰۱۸, China*

H. B. Liao - *School of Mechanical Engineering, Hangzhou Dianzi University, Hangzhou, Zhejiang, ۳۱۰۰۱۸, China*

Y. Z. Zhang - *School of Mechanical Engineering, Hangzhou Dianzi University, Hangzhou, Zhejiang, ۳۱۰۰۱۸, China*

J. R. Xu - *School of Science, Hangzhou Dianzi University, Hangzhou, Zhejiang, ۳۱۰۰۱۸, China*

خلاصه مقاله:

A comparative study of the buoyancy-opposed wall jet has been carried out using RANS methods (including RNG model, Realizable k-ε model, and two low Reynolds number k-ε models) and LES methods (including the subgrid scale model developed by Smagorinsky et al.(۱۹۶۳), Germano et al. (۱۹۹۱) and Kim et al. (۱۹۹۷)). The capability of each turbulence model to predict the flow field and temperature field in mixing stage was investigated. The results show that the k-ε series model can accurately predict the velocity distribution of flow field under isothermal case. However, in the case of buoyancy, due to the assumption of turbulent normal stress isotropy, the trend of temperature change in the mixing region and transition position existed an obvious deviation with experimental data. The LES methods, solved directly the large scale vortices, take into account the influence of turbulence stress anisotropy in the mixing region on the temperature change and capture the temperature change trend over the whole domain accurately. Due to the application of the subgrid kinetic energy transport equation, KET model has certain advantages in numerical simulation of similar engineering flow phenomenon.

کلمات کلیدی:

Buoyancy effect, Wall jet, LES, Sub-grid kinetic energy transport equation

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