

عنوان مقاله:

A Delayed Detached Eddy Simulation Model for the Simulation of Complex Turbulent Flow

محل انتشار:

دوماهنامه مکانیک سیالات کاربردی، دوره 15، شماره 4 (سال: 1401)

تعداد صفحات اصل مقاله: 14

نویسندگان:

L. J. Zhai - Shanghai Key Laboratory of Mechanics in Energy Engineering, Shanghai Institute of Applied Mathematics and Mechanics, School of Mechanics and Engineering Science, Shanghai University, Shanghai, Shanghai ۲۰۰۰۷۲, China

H. X. Chen - Shanghai Key Laboratory of Mechanics in Energy Engineering, Shanghai Institute of Applied Mathematics and Mechanics, School of Mechanics and Engineering Science, Shanghai University, Shanghai, Shanghai ۲۰۰۰۷۲, China

Z. Ma - Chinese Ship Scientific Research Center, Shanghai, Shanghai ۲۰۰۰۱۱, China

خلاصه مقاله:

A new turbulent model based on Delayed Detached Eddy Simulation (DDES) with non-linear eddy viscosity model (NLEVM) was developed to predict the complex turbulent flow. The numerical simulation of the triangular cylinder and the centrifugal pump was carried out to investigate the ability and applicability of the DDES model based on NLEVM (DDES_NL). Compared to the turbulent model based on the eddy viscosity model, the computational results of the triangular cylinder showed the advantage of the non-linear eddy viscosity modification in the DDES_NL model which can improve the accuracy of the prediction in the flow phenomenon with a relatively simple turbulence structure. Regrettably, some small-scale turbulent structures among those still cannot be captured accurately. The numerical simulation of the centrifugal pump predicted by the DDES_NL model shows more abundant flow structures and gets close to the realistic statistical characteristics. It also proves the good applicability of the DDES_NL model in complex .flow. This study aims to contribute to the growing area of turbulence modeling by exploring it

کلمات کلیدی:

Turbulence model, Non-linear eddy viscosity model, Delayed detached eddy simulation model

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1460571>

