INVESTIGATION OF VARIOUS TURBULENCE MODELS ACCURACY IN CFD SIMULATION OF VERTICAL AXIS WIND TURBINES

P. Fard, M. Layeghi, A. Foruzandeh, A. Borujerdi,
Energy Department, Materials and Energy Research Center, Karaj, Tehran

Computational Fluid Dynamics can be defined as the analysis of systems involving fluid flow, heat transfer and associated phenomena such as chemical reactions by computer based simulation. Using this technique became popular since the 1980's in the wind turbine industry to save a significant amount of time and money which was required for wind tunnel test. In practice, the assumptions made regarding the modeling of the turbulent component of engineering flows have proved to be a major source of error in wind engineering simulations. These fundamental errors are one of the main reasons why computational fluid dynamics techniques have not yet been fully accepted by the wind engineering community.
In this research, the authors have detailed and tested some of the most widespread techniques and compared their accuracy and shortcomings in computational wind engineering. In this respect standard, RNG and realizable k-model, k-, Spalart-Allmaras and Reynolds stress model have been taken into account for simulation of a vertical axis wind turbine performance.

PAYAM SABEI FARD
Materials and Energy Research Center Tehran
Energy Department

Imam khomeini Boulevard
Meshkin Dasht, Karaj
Iran

payam.sabaeifard@gmail.com
http://sabaeifard.webs.com