

عنوان مقاله:

Numerical analysis of cavity and airfoil shape effects on aerodynamic performance of horizontal wind turbine

محل انتشار:

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خلاصه مقاله:

In this study, a numerical analysis of cavities and an airfoil shape effect on the aerodynamic performance of a horizontal wind turbine has been investigated using STAR-CCM software. The National Renewable Energy Laboratory (NREL) phase VI rotor with 10 m diameter was used as the baseline rotor and the CFD results were validated using the experimental outputs of power and pressure coefficients. The results of our solution indicate that the output power has been decreased. In addition, to improve the performance, we used a winglet airfoil (S809) and tested in different speeds. In the end, by comparing the results with experimental data, we found out that that negative winglet gets the energy better than the positive types and also we showed that the cavities that we used not only cannot delay the separation, but also they decrease the wind turbine performance.

کلمات کلیدی:

Aerodynamics, Wind turbine blade, CFD, STAR-CCM, Cavity, Winglet, Performance

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