

## عنوان مقاله:

CFD simulation of the effective parameters on an offshore wind turbine blade under pitch platform motion

## محل انتشار:

هفتمین همایش بین المللی علوم و تکنولوژی با رویکرد توسعه پایدار (سال: 1401)

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## خلاصه مقاله:

A floating horizontal-axis wind turbine (FHAWT) aerodynamic is relatively more complicated than an onshore wind turbine due to being subjected to the six degrees of freedom (DOFs) motions. Among these motions, surge and pitch have the strongest influence on performance of offshore wind turbines. Nevertheless, research has indicated that by using a winglet in the blade tip, it is possible to improve the performance of the wind turbine by extracting more energy from the wind. This work has investigated the unsteady aerodynamic properties of the NREL-5MW floating wind turbine with an SDY062 airfoil winglet at the blade tip, one of the three popular airfoils used to simulate offshore wind turbines. Then we studied the wake effect of the turbine under pitch platform motion using unsteady Reynolds averaged Navier-Stokes (URANS). First, the numerical simulation method in this paper is validated with available data of the NREL Phase VI wind turbine. Afterward, computations were performed for three various angles of attack  $0^\circ$ ,  $5^\circ$  and  $10^\circ$  at  $Re = 10^6$  for the wind turbine with winglet. Finally, the floating offshore wind turbine aerodynamic characteristics were investigated under the pitch motion with an amplitude and frequency. The result shows that an offshore wind turbine blade using a winglet in with a pitch platform motion can produce more output power in the three mentioned angles.

## کلمات کلیدی:

Floating offshore wind turbine, Computational fluid dynamics (CFD), winglet, surge platform motion

## لینک ثابت مقاله در پایگاه سیویلیکا:

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