

Active Aerodynamic Blade Load Control Impacts on Utility-Scale Wind Turbines*

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Abstract

The effect of implementing Active Aerodynamic Load Control on the trailing edge of the blade tip for 1.5MW and 5MW wind turbines has been investigated. These results are based on time-series simulations performed with the NREL FAST/AeroDyn code. An increase in blade length of 10% was found to result in 10-15% increase in energy capture and a corresponding 9-5% decrease in Cost of Energy for the 1.5MW turbine. Two different configurations of trailing edge flaps were investigated and found to be equally effective at controlling fatigue damage accumulation. The impact of neglecting the blade torsional mode in this work has been found to have a minor impact on the results.

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