

Study of wake measurement wind turbine model using PIV

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Abstract

It is important to consider effect of wind turbine oncoming air flow since it generate wake flow which are a cause for reduction in power output for downstream turbine in wind farm and also it increase level of turbulence which is a reason for unsteady loading on downstream turbine. In order to study effect of wind turbine wake different kind of wind turbine model is considered. Velocity field in the wake and turbulence characteristics are measured using particle image velocimetry single rotor wind turbine model (SRWTM), twin wind turbine model (TWTM) and double rotor wind turbine model (DRWTM).The measurement is performed to cover area behind wind turbine rotor. The measurement indicated that characteristics of near wake flow and downstream of the rotor depend on number of blade rotor, interaction among turbine since they causes deceleration in airflow stream as they passes through turbine model. Flow field measurement for phase locked of different wind turbine model indicates characteristics of the turbulent model wake flow and vortex behind the wind turbine. In order to study the wake characteristics for co rotating and counter rotating DRWT the velocity deficits is investigated in comparison to SRWT. Finally effect of wake meandering, which is crucial factor in wind farm since it increase fatigue load and yaw load on downstream turbine, for wind turbine which include wake motion along vertical and horizontal direction is studied.

Biography

Chala Daniel has studying his masters of science in National Taiwan University of Science and Technology. He have ambition to build a long term career in Conventional and Sustainable Energies.

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