

Abstract Submitted  
for the DFD11 Meeting of  
The American Physical Society

**Experimental investigation of turbulence characteristic around a scaled wind turbine**<sup>1</sup> RAMIRO CHAVETZ ALARCON, New Mexico State University, B.J. BALAKUMAR, Los Alamos National Laboratory, FANGJUN SHU, New Mexico State University — Experiments on a scaled model wind turbine, designed using blade element momentum theory, were performed under laminar inflow conditions with and without yaw. A detailed dataset containing wake structure variations under yawed inflow was obtained to provide useful validation data for certain classes of simulation codes. Phase locked PIV experiments performed at various blade orientations (phases) showed that the turbulence characteristics in the mid- to far-wake region is approximately axisymmetric. The power extracted by the model was obtained from the horizontal velocity deficit observed at the wake and compared with the power obtained from torque sensor measurements. Significant differences between these two measurements demonstrate the importance of losses due to viscous and turbulent dissipation.

<sup>1</sup>Supported by Los Alamos National Laboratory's LDRD program through Grant # 20100040DR.

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Date submitted: 10 Aug 2011

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