Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Induction factor optimization through variable lift control JOHN COONEY, THOMAS CORKE, ROBERT NELSON, THEODORE WILLIAMS, University of Notre Dame — Due to practical design limitations coupled with the detrimental effects posed by complex wind regimes, modern wind turbines struggle to maintain or even reach ideal operational states. With additional gains through traditional approaches becoming more difficult and costly, active lift control represents a more attractive option for future designs. Here, plasma actuators have been explored experimentally in trailing edge applications for use in attached flow regimes. This authority would be used to drive the axial induction factor toward the ideal given by the Betz limit through distributed lift control thereby enhancing energy capture. Predictions of power improvement achievable by this methodology are made with blade - element momentum theory but will eventually be demonstrated in the field at the Laboratory for Enhanced Wind Energy Design, currently under construction at the University of Notre Dame.

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Date submitted: 04 Aug 2011 Electronic form version 1.4