

Abstract Submitted  
for the DFD11 Meeting of  
The American Physical Society

**Large Field of View Particle-Image Velocimetry (LF-PIV): Design and Performance**<sup>1</sup> SUHAS POL, JOHN HOFFMAN, BALAKUMAR BALASUBRAMANIAM, P-23, LANL TEAM — We discuss the challenges and limitations associated with the development of a Large Field of View Particle Image Velocimetry (LF-PIV) diagnostic that is capable of resolving large scale motions (3m x 1m per camera) in gas phase laboratory experiments. While this diagnostic is developed for the measurement of wakes and local inflow conditions around research wind turbines, the design considerations provided here are also relevant for the application of LF-PIV to atmospheric boundary layer, rotorcraft dynamics and large-scale wind tunnel flows. Scaling laws associated with LF-PIV systems are presented along with the performance analysis of low-density, large diameter Expancel particles that appear to be promising candidates for LF-PIV seeding. Comparison of data obtained by LF-PIV measurements (2MP camera) and regular format sized PIV measurements show an agreement of within 1% for mean velocity and 8% for turbulent statistics respectively.

<sup>1</sup>Los Alamos National Laboratory, NM, USA

Suhas Pol

Date submitted: 05 Aug 2011

Electronic form version 1.4