

Abstract Submitted  
for the DFD09 Meeting of  
The American Physical Society

**Evaluation of burst-mode LDA spectra with implications** CLARA VELTE, DTU, WILLIAM GEORGE, Chalmers University of Technology — Burst-mode LDA spectra, as described in [1], are compared to spectra obtained from corresponding HWA measurements using the FFT in a round jet and cylinder wake experiment. The phrase “burst-mode LDA” refers to an LDA which operates with at most one particle present in the measuring volume at a time. Due to the random sampling and velocity bias of the LDA signal, the Direct Fourier Transform with accompanying weighting by the measured residence times was applied to obtain a correct interpretation of the spectral estimate. Further, the self-noise was removed as described in [2]. In addition, resulting spectra from common interpolation and uniform resampling techniques are compared to the above mentioned estimates. The burst-mode LDA spectra are seen to concur well with the HWA spectra up to the emergence of the noise floor, caused mainly by the intermittency of the LDA signal. The interpolated and resampled counterparts yield unphysical spectra, which are buried in frequency dependent noise and step noise, except at very high LDA data rates where they perform well up to a limited frequency.

[1] Buchhave, P. **PhD Thesis**, SUNY/Buffalo, 1979.

[2] Velte, C.M. **PhD Thesis**, DTU/Copenhagen, 2009.

Clara Velte  
DTU

Date submitted: 11 Aug 2009

Electronic form version 1.4