

Abstract Submitted
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Development of a Time Synchronized CW-Laser Induced Fluorescence Measurement for Quasi-Periodic Oscillatory Plasma Discharges¹

NATALIA MACDONALD, MARK CAPPELLI, Stanford University, WILLIAM HARGUS, JR, Air Force Research Laboratory, Edwards AFB — An advanced CW laser induced fluorescence diagnostic technique, capable of correlating high frequency current fluctuations to the resulting fluorescence excitation lineshapes, has been developed. This presentation describes this so-called “Sample-Hold” method of time-synchronization, and provides the steps taken to validate this technique, including simulations and experimental measurements on a 60 Hz Xe lamp discharge. Initial results for time-synchronized velocity measurements on the quasi-periodic oscillatory mode of a magnetic cusped plasma accelerator are also presented. These results show that the positions of the ionization and peak acceleration regions in the device vary over the course of a discharge current oscillation.

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