Laser-Induced Fluorescence Diagnosis of Plasma Ions*

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Laser-induced fluorescence (LIF) has been developed and utilized to diagnose plasma ions for about two decades at Irvine and elsewhere. The most common laser configuration has utilized pump and dye lasers, an effective and expensive diagnostic. Over the past two years the Irvine plasma laboratory has developed diode lasers to perform LIF experiments1. Diode lasers now can do many LIF measurements for about 20% of the capital investment of the pump/dye laser combination. LIF can be used to measure ion distribution functions with 1 mm and 1 sec resolutions. Ion temperature, diffusion and convection in real space and velocity space are readily measured. The laser diagnostic and samples of the ion heating and transport measurements will be presented. Further details are available at http://HAL9000.ps.uci.edu.

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1) *Argon Ion Laser-Induced Fluorescence with Diode Lasers*, G.D. Severn, D.A.Edrich, and R. McWilliams, Rev. Sci. Instrum. 69, 10 (1998).