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EXPERIMENTAL RESEARCH ON OPTOGALVANIC EFFECTS(U)  
WISCONSIN UNIV-MADISON DEPT OF PHYSICS J E LAWLER  
05 JUN 86 AFOSR-RR-86-0518 AFOSR-84-2298

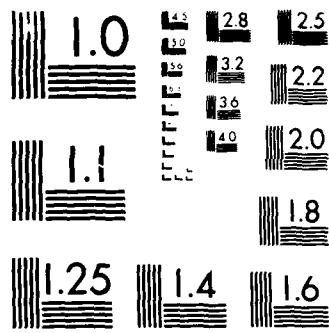
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The equipment acquired under a DOD University Research Instrumentation Program Grant is described. Applications of the equipment in ongoing DOD sponsored research on optogalvanic effects is reported.		

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Final Technical Report

to the

Air Force Office of Scientific Research

Grant AFOSR-84-0298

under the

University Research Instrumentation Program

Principal Investigator: J. E. Lawler

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pattern and determine the laser wavelength. This wavemeter is well suited for use with pulsed or c.w. dye lasers. Other wavemeters based on Michelson interferometers which have moving mirrors and which involve sequential detection of fringes are not suited for use with pulsed lasers. Pulsed dye lasers typically have very low ( $\sim 10^{-7}$ ) duty cycles. We built a cart for the Fizeau wavemeter and associated computer and oscilloscope. It is now shared among three laser laboratories and is in steady use.

The second item we purchased was a Spex 1403 Double Spectrometer. A double spectrometer with large holographic gratings, such as this one, produces very good rejection of stray light (approximately  $10^{-14}$  when  $20 \text{ cm}^{-1}$  off the bandpass). This exceedingly high rejection is essential in a variety of fluorescence and scattering experiments in discharge plasmas. It makes it possible to see very weak signals against bright background light at nearby wavelengths. We have no other instrument which achieves comparable performance. The Spex 1403 Double Spectrometer has also been built into its own cart so that it can be shared among several laser laboratories.

The final item we purchased under this grant was a Spellman High Voltage Regulated Power Supply. This is a 3 kV supply which can deliver 0.5 Amp. It is regulated to 0.01%. We need it to run large stable discharges. Optogalvanic diagnostics achieve maximum sensitivity in stable well behaved discharges. The high degree of regulation is essential if we are to get the maximum amount of information from optogalvanic diagnostics.

In summary three pieces of capital equipment were purchased under this grant including: a Fizeau laser wavemeter, a double spectrometer, and highly regulated high voltage power supply. All are being used in ongoing research on optogalvanic effects.

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