Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Array for high spatial resolution multi-parameter fiber optic sensing P. HENNING, R.J. OLSSON[1], A. BENKO, A.W. SCHWABACHER, P. GEISSINGER, Department of Chemistry and Biochemistry, University of Wisconsin - Milwaukee — A novel 10x10 fiber optic distributed sensor array has been developed, capable of both positional sensing and specialized chemical sensing. Each sensor consists of two crossed optical fibers, in which the claddings are removed and replaced by an environment that includes highly fluorescent molecules. Light is evanescently coupled from the source fiber to the material, which in turn fluoresce. The fluorescent light is detected via the sensing fiber. Since each fluorescent signal can be delayed in time by the overall length of each sensor fiber, the response of two sensors only millimeters apart are resolvable. By tailoring the aspects of each sensor for high sensitivity to a specific parameter, a variety of properties can be evaluated simultaneously, while the positional dependence of a given factor across the array can be observed.

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Date submitted: 25 Jan 2005 Electronic form version 1.4