

Abstract Submitted  
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**Integrated Fiber-optic Dipping-probe Microfluorometer** ROBERT W. GAMMON, IPST, Univ. of Maryland, VILDANA HODZIC, CHRISTOPHER C. DAVIS, Department of Electrical and Computer Engineering, Univ. of Maryland — An integrated fiber-optic device has been built that is with multimode fiber and found to exhibit exceptional performance as a dipping probe microfluorometer. This was discovered in the course of testing its performance using the device with simple, cleaved fibers. Thus the fiber both excites and collects fluorescence from the fluid along the axis direction in solutions of dye. The novel feature is that the light is restricted to coming from a region very near the end of the cleaved fiber. It then lends itself to testing very small volumes of sample fluid for fluorescence. Since the probe is a 200 micron diameter multimode fiber it can easily fit into small capillaries and also be stuck into small drops of sample fluid, i.e. drops sitting in microwell in multi-well test plates. Because the device uses an avalanche photodiode, the sensitivity is high and has a large dynamic range (4 to 6 orders of magnitude). The combination of small diameter, flexible fibers with high efficiency of exciting and collecting of fluorescence, and a sensitive detector makes this device unique. There is nothing on the commercial market or literature like it. Most devices that are called fiber-optic fluorimeters use stiff fibers of diameter about 1 mm or larger (rods, really). They usually excite through one or more fibers and collect through nearby fibers. The collection efficiency is low and the net diameters are far too large to allow use with microliter samples.

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