

Two-Inch Borehole Fluorometer for Tracer Tests and Turbidity Measurement.

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We present a new design of a rugged, downhole, flow-through field fluorometer able to set-up down to depths of 70 m into 2" boreholes. The fluorometer head has inlets and outlets allowing free natural water circulation through an optical cell, requiring no external pump. Very low power consumption of the two lamps and electronics allows unattended measurements during weeks. A double-excitation, double detection scheme makes it possible to track sub-PPB concentrations of two dye tracers simultaneously, while measuring the water turbidity. The tracer cocktail can contain two dyes chosen among two classes:

I. uranine (fluorescein) or pyranine, and

II. amidorhodamine G, sulforhodamine B, rhodamine B or rhodamine WT.

An electrical cable drives the analog signals to a remote data logger that monitors the measuring sequence and stores the acquired data on a PC-compatible memory card. The new compact design of the fluorometer head makes it possible the extension of tracer tests toward the world of 2" boreholes.