FIBER OPTIC CAVITY RING-DOWN SPECTROSCOPY

KEVIN K. LEHMANN, PETER B. TARSA, and PAUL RABINOWITZ, *Princeton University, Department of Chemistry, Princeton, NJ 08544*.

Recent investigations have led to the implementation of Cavity Ring-down Spectroscopy (CRDS) in an optical fiber resonator, allowing the characterization of component loss, bending attenuation, and bulk chemical analysis. By incorporating a biconically tapered single mode fiber into such a fiber resonator, we demonstrate the application of continuous wave CRDS to near-field spectroscopic measurement of both absorbing and scattering species in the evanescent field surrounding the taper. Furthermore, chemical modification of the tapered fiber's surface facilitates label free detection of a single cell, opening the possibility of highly sensitive and specific spectroscopic measurement of a variety of biological species.