A PASSIVE OPTICAL FIBER RESONATOR FOR CAVITY RINGDOWN SPECTROSCOPY

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A novel device for quantitative measurement of trace species by cavity ringdown spectroscopy with a fiber optic resonator is presented. The resonator is formed by two low ratio couplers and a length of optical fiber to allow detection through attenuation of the evanescent field surrounding the fiber. The device has been demonstrated to accurately measure the loss in an optical fiber system and is being developed as a chemical sensor through efforts to reduce internal loss and increase interaction of the evanescent wave with the sample medium. This improvement over current evanescent wave fiber optic sensors provides increased sensitivity while also expanding the applicability of ringdown spectroscopy to include distributed sensing and spectroscopy in liquids.