PRISM-BASED CAVITY RING DOWN SPECTROSCOPY: BROADBAND AND ULTRAHIGH REFLECTIVITY

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Prism-based ring-down cavity consists of a pair of super-polished, Brewster angle roof prisms - one having a curved surface - forming a stable ring resonator. The prism design was conceived by Prof. Kevin Lehmann and Dr. Paul Rabinowitz and a patent for the design has been issued in 1999. The spectral range of prism cavity is limited only by the absorption and the scattering of the prism material itself. A single ring down cavity can be used over a wide spectral range, from the near UV to the mid-IR without any changes in optics or alignment. Recently, we have demonstrated that prism-based ring-down cavity has equivalent reflectivity greater than 0.999987. Our test data covers the near IR ranges from 1300nm to 1700nm and we will extend it to visible and UV ranges. The highest loss occurred at 1390nm which reflectivity is as good as 0.99995. Our prisms can greatly extend the CRDS capability to allow for broadband spectral scan and multi-species detection and will be a powerful tool for academic and industrial applications.