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High resolution cavity-enhanced absorption spectroscopy

Abstract

Optical cavities are used to increase the sensitivity and selectivity of absorption methods in molecular spectroscopy, analytics and monitoring applications, such as trace gas detection. In this presentation the experimental principle of cavity-enhanced absorption techniques will be explained. A high resolution measurement of the rovibrational structure of several water isotopologues in the near infrared will be used as an example of this methodology.

Biography

Andy Ruth, academic staff member of the Physics Department, is one of the pioneers of cavity enhanced absorption techniques. His group at UCC were the first to show that incoherent (white-)light sources can be utilized in cavity enhanced absorption methods, which substantially simplified the technical approach, enabled high time resolution for kinetic measurements, and exploited multiplexing advantages for monitoring applications. By now many groups all over the world (notably in China and the USA) use his approach, called incoherent broadband cavity enhanced absorption spectroscopy (IBBCEAS).