TRACE GAS DETECTION WITH C.W. CAVITY RING-DOWN LASER ABSORPTION SPECTROSCOPY

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We are continuing to develop a technique to measure trace concentrations of gases in the near infrared region using continuous wave excitation of a high finesse optical cavity. The near-IR contains both vibrational overtone transitions and forbidden electronic transitions of many atmospherically important species. Recently, our research has focused on investigating the properties of the cavity ring-down system with the desire to enhance the detection sensitivity of these atmospherically important species. For instance, we have observed interference effects between the AR coated surface and the highly reflective surface of the cavity mirrors. By injecting the light at an incident angle to the AR surface of the front cavity mirror while maintaining the cavity alignment, we can remove these interference effects and increase the detection limit.