



Nitrogen Oxides, Aerosols, Oxygenated VOC and Beyond: Applications of Visible Cavity Enhanced Spectroscopy to Atmospheric Measurements

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Cavity enhanced extinction spectroscopy, in which the long effective path lengths available within an optical cavity provide a highly sensitive means for the measurement of optical extinction, has seen increasing applications as an analytical method in atmospheric science in recent years. This presentation will survey recent applications of cavity enhanced spectroscopy to field instrumentation from our laboratories, with an emphasis both on the changes in technology that have taken place over the years and lessons learned from in-field use of these instruments. Examples include detection of nocturnal nitrogen oxides (NO_2 , NO_3 and N_2O_5) by cavity ring-down spectroscopy, beginning with pulsed lasers but more recently with diode lasers; aerosol extinction spectroscopy; and measurements of α -dicarbonyls using broadband methods. Although all of these examples are based on visible spectroscopy, the techniques are illustrative of the variety of different light sources now available, and they allow for some comparison between different approaches in terms of sensitivity and specificity.