



## **Automated Soil Flux Chamber Measurements with Five Species Cavity Ring-Down Spectroscopy and New Realtime Soil Flux Processor**

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Continuous soil flux chamber measurements remains a key tool for determining production and sequestration of direct and indirect greenhouse gases. Cavity Ring-Down Spectroscopy has radically simplified soil flux studies by providing simultaneous measurements of five gases: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, NH<sub>3</sub>, and H<sub>2</sub>O in one analyzer (Picarro G2508) and by lending itself to field deployment. Successful use of the Picarro G2508 for continuous soil flux measurements in a variety of ecosystem types has already been demonstrated.

Most recently, we have developed a real-time processing software to simplify chamber measurements and calculations of soil flux with the G2508 CRDS analyzer. The new Realtime Soil Flux Processor is designed to work with all chamber types and sizes, and provides a multi-option for real-time flux curve mathematical fitting and generation of flux values of N<sub>2</sub>O, CO<sub>2</sub> & CH<sub>4</sub> in addition to NH<sub>3</sub> and H<sub>2</sub>O.

The software features include:

Sequence table

Flexible data tagging feature

Ceiling concentration shut-off parameter

Set run-time interval

Temperature/pressure input for field monitoring and volumetric conversion

Manual start/stop override

The Realtime Soil Flux Processor GUI interface and functionalities are presented, and results from a variety of sampling designs are demonstrated to emphasize program flexibility and field capability.