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A New Approach to Detecting Fluxes of Gaseous Elemental Mercury

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The air-surface exchange of mercury is a subject of intensive research. Our understanding of mercury fluxes and speciation is currently limited by the sensitivity and time resolution of existing methods. Here we present a novel approach to measurement of mercury fluxes using diode lasers coupled with optical cavities, and detection via fluorescence.
This combination will result in a sensitive, rapid, and portable instrument, potentially useful for micrometeorological flux measurements. Owing to the extremely low concentration of ambient mercury, distinguishing the mercury signal from Rayleigh scattering of air is crucial. We present our approach to tackling this problem and results thus far.