



## **An Ensemble Kalman Filter for assimilating upcoming CO<sub>2</sub> column measurements from OCO and GOSAT**

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We have developed an Ensemble Kalman Filter (EnKF) to quantify surface CO<sub>2</sub> fluxes using upcoming CO<sub>2</sub> column data streams from the NASA Orbiting Carbon Observatory (OCO) mission and the Japanese Greenhouse Gases Observing Satellite (GOSAT) due for launch in 2008. This assimilation approach avoids the development of the ad-joint model and has greater flexibility when considering a simultaneous inversion of related trace gases, but introduces other difficulties that will be briefly outlined. We will present preliminary results from one-year simulation experiments that assess the sensitivity of CO<sub>2</sub> flux patterns, estimated using the EnKF, to the spatial and temporal resolution of data and to the formulation of the EnKF. The forward operator comprises the GEOS-Chem chemistry transport model, forced by flux inventories and NASA GEOS-4 meteorology, and simulated averaging kernels generated by the OCO retrieval software for different observation conditions such as surface type, solar zenith angle, and optical depth. The orbital configuration and footprint of OCO observations are simulated using Aqua data, while cloudy and aerosol-laden scenes, determined by GEOS-Chem, are removed from subsequent analyses.