



The OCO-3 Mission: Measuring Carbon Dioxide from the International Space Station and Details of Snapshot Map Mode

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The Orbiting Carbon Observatory 3 (OCO-3) will continue global CO₂ and solar-induced chlorophyll fluorescence (SIF) using the flight spare instrument from OCO-2. The instrument has been through ground testing and thermal vacuum, and will be packaged for installation on the International Space Station (ISS), currently scheduled for launch in March 2019. This talk will focus on one of the new capabilities of OCO-3, the Snapshot Area Maps.

The low-inclination ISS orbit lets OCO-3 sample the tropics and sub-tropics across the full range of day-light hours with dense observations at northern and southern mid-latitudes ($\pm 52^\circ$). The combination of these dense CO₂ and SIF measurements provides continuity of data for global flux estimates as well as a unique opportunity to address key deficiencies in our understanding of the global carbon cycle. The instrument utilizes an agile, 2-axis pointing mechanism (PMA), providing the capability to look towards the bright reflection from the ocean and validation targets. In addition to the nadir-, glint-, and target-mode geometries familiar from OCO-2, OCO-3 includes a new observation mode dedicated to mapping out larger spatial-scale emitters like cities. This Snapshot Area Map (SAM) mode will be used to map areas of up to 100x100 km² on the Earth surface with the standard OCO-3 ground footprints of 2x2 km², providing unprecedented high spatial resolution coverage of large-scale CO₂ emitters worldwide. Measurements over urban centers could aid in making estimates of fossil fuel CO₂ emissions. Similarly, the snapshot mapping mode can be used to sample regions of interest for the terrestrial carbon cycle.

This talk will focus on details of the planned observations of SAMs, including the sampling locations, details of the simulated maps, frequency of revisit over the year, hours of the day that are sampled, and the plans for making the data easily accessible to the community.