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Poster
The Orbiting Carbon Observatory (OCO) 2 and 3 instruments have been making continuous measurements of CO2 and far-red Solar-Induced Fluorescence (SIF) since 09/2014 (OCO-2) and 09/2019 (OCO-3). OCO-2 flies on a dedicated space craft in sun-synchronous orbit with a fixed 1330h equator crossing time and observes at all latitudes. OCO-3 is installed on the International Space Station (ISS), which limits measurements to within a latitude band of about 52°S-52°N due to the ISS orbit inclination but allows observations to be made at different local times between sunrise and sunset. All OCO-2&3 data products are publicly available on the NASA GES-DISCs.

The two OCO instruments have a similarly-sized swath width of 12-15 km across-track subdivided into 8 footprints, with ground pixels sizes between 3.5 km2 and 4.5 km2. OCO-2 measurements consist of three distinct observation modes: nadir over land, glint over ocean, and a target mode over select locations primarily for CO2 and SIF validation purposes. In addition to these three modes, OCO-3 also includes a Snapshot Area Mapping (SAM) mode, a spatially extended target mode where areas between 50x50 km2 and 80x80 km2 are covered continuously. SAM observations are mainly performed over cities to monitor urban CO2 emissions, but the list of locations includes several sites dedicated to SIF validation.

Both CO2 and SIF retrievals are performed on all observation modes and at all locations. SIF retrievals are performed in two narrow wavelength regions around the O2 A band, centered at 757 nm and 771 nm. The raw retrievals are subject to a background correction and are also scaled at the time of overpass with a daily average using solar illumination calculations within ±12 hours for each location. The publicly distributed SIF data product consists of daily files of single-footprint SIF observations, including the fully adjusted and background-corrected SIF values as well as the raw retrievals.

We present an overview of the OCO-2&3 mission design and operations, a summary of the currently available SIF data products from OCO-2 and OCO-3, updates on the release of upcoming product versions, recent work on the collocation of OCO-3 SIF and ECOSTRESS evapotranspiration observations, as well as future plans for mission operations.
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