The GeoCarb Mission: Recent Progress and Scientific Necessity
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Since selection in 2016, the OU/NASA-led GeoCarb Mission has navigated successfully through numerous challenges towards building the first ever geostationary greenhouse gas observatory. The mission was cancelled in November 2022 because of cost-overruns by the instrument lead, Lockheed Martin Advanced Technology Center (LM-ATC) and the claim by NASA that they had an alternative plan for GHG measurements, including buying data from commercial platforms and extending the life of OCO-2 and OCO-3. The University of Oklahoma's GeoCarb leadership team was instructed to make as much progress as possible with remaining mission funds to ship the instrument to NASA before the close of CY 2023.

Instrument progress in 2023 was significant, which includes a completely integrated instrument hardware, electronics, and software and a planned 30-day ThermoVac test in September 2023 to assess instrument performance, including solar measurements via a heliostat of CO2, CH4, and CO with a co-located EM27/Sun FTIR. This initial calibration and characterization will be accompanied by a report on the future characterization and calibration tests that needed to be completed before instrument storage and a potential future GEO flight. This paper will discuss the 2023 progress, scientific readiness, and plans for the future. It will also restate the need for GHG measurements from GEO and, in light of NASA's limited missions of GHG measurements going forward, we will solicit feedback from the community on potential synergies with the objectives of other missions like CO2M, GOSAT-GW, and Sentinel-5 as well as future field campaigns.
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