

Assimilation of CO₂ from ACOS GOSAT and AIRS into the GEOS5 constituent assimilation system

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We present the results of assimilating CO₂ retrievals from Atmospheric CO₂ Observations from Space (ACOS) of the Greenhouse gases Observing Satellite (GOSAT) combined with retrievals from the Atmospheric Infrared Sounder (AIRS). These two instruments are sensitive to CO₂ in significantly different levels of the atmosphere, with lower tropospheric information from ACOS GOSAT and mid-tropospheric information from AIRS. These observations are assimilated into the GEOS5 constituent assimilation system and we show how the combined measurements can be used to improve estimates of tropospheric CO₂ profiles through comparisons with aircraft and ground based in-situ measurements. We also describe the extraction of systematic errors in the data, and the development of a bias correction scheme for the assimilation system.