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Oral
Carbon dioxide (CO2) emissions from combustion sources are uncertain in many places across the globe. Satellites can detect and quantify emissions from large CO2 point sources, including coal-fired power plants. In this work, we analyze a small number of collocated observations from the Orbiting Carbon Observatory-3 (OCO-3) instrument and the Earth Surface Mineral Dust Source Investigation (EMIT) instrument, both onboard the International Space Station (ISS). These observations are of CO2 point sources both in the U.S., where there is continuous emission monitoring system (CEMS) validation, and internationally where validation is lacking. The near-simultaneous measurements allow for an unprecedented comparison of two space-based greenhouse gas sensors with different characteristics over both isolated coal-fired power plants and multi-source clusters of power plants. We estimate emissions from OCO-3 and EMIT observations using multiple methodologies (e.g., integrated mass enhancement, Gaussian plume model, cross sectional flux), compare to CEMS where available, and discuss the pros and cons of the different instruments and methodologies.
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