

Robert

Nelson

Jet Propulsion Laboratory, California Institute of Technology

Daniel H. Cusworth, Carbon Mapper, Pasadena, CA, USA, Arizona Institutes for Resilience, University of Arizona, Tucson, AZ, USA

Andrew K. Thorpe, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

Jinsol Kim, Carbon Mapper, Pasadena, CA, USA

Clayton Elder, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

Kate Howell, Carbon Mapper, Pasadena, CA, USA

Charles E. Miller, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

Riley M. Duren, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA, Carbon Mapper, Pasadena, CA, USA, Arizona Institutes for Resilience, University of Arizona, Tucson, AZ, USA

Ray Nassar, Environment & Climate Change Canada, Toronto, Ontario, Canada

Jon-Paul Mastrogiacono, University of Toronto, Toronto, Ontario, Canada

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.

Presentation file

[Nelson-Robert.pdf](#)

Meeting homepage

[IWGGMS-20 Workshop](#)

[Download to PDF](#)