Daniel
Varon
Harvard University, School of Engineering and Applied Sciences
Daniel J. Jacob, Harvard University School of Engineering and Applied Sciences
Lucas A. Estrada, Harvard University School of Engineering and Applied Sciences
Melissa Sulprizio, Harvard University School of Engineering and Applied Sciences
Nicholas Balasus, Harvard University School of Engineering and Applied Sciences
Mark Omara, Environmental Defense Fund
Ritesh Gautam, Environmental Defense Fund
Joannes D. Maasakkers, SRON Netherlands Institute for Space Research
Sudhanshu Pandey, Jet Propulsion Laboratory California Institute of Technology
John R. Worden, Jet Propulsion Laboratory, California Institute of Technology
Kevin W. Bowman, Jet Propulsion Laboratory, California Institute of Technology
Marc Watine-Guiu, Harvard University School of Engineering and Applied Sciences & United Nations Environment Programme International Methane Emissions Observatory
Itziar Irakulis-Loitxate, United Nations Environment Programme International Methane Emissions Observatory & Research Institute of Water and Environmental Engineering (IIAMA) Universitat Politècnica de València (UPV)
Cynthia A. Randles, United Nations Environment Programme International Methane Emissions Observatory
Oral
High-frequency satellite observations of atmospheric methane from low-Earth and geostationary orbit can enable continuous monitoring of methane emissions to improve understanding of emission trends, track progress of mitigation efforts, and detect large intermittent releases. In this talk we present two frameworks for such monitoring. (1) We describe an inverse modeling framework for weekly monitoring of methane emissions at ~25-km resolution in user-selected source regions using TROPOMI satellite observations and the Integrated Methane Inversion (IMI v2.0). We apply this framework to quantify weekly methane emissions from five high-emitting US oil and gas basins (Anadarko, Barnett, Eagle Ford, Haynesville, Permian) for 2022–2023, and verify our inversion results against independent in-situ observations and flux analyses. We further monitor the weekly national total methane emission from Turkmenistan for 2020–2023 to evaluate trends. (2) We present a record of extreme and transient methane point sources detected with the Geostationary Operational Environmental Satellites (GOES) with 5–10-minute scans of the Americas. We use the high-frequency GOES measurements to visualize the full evolution of large methane releases from
oil and gas infrastructure, including the variable source rate, total duration, and total emission.
Meeting homepage
IWGGMS-20 Workshop
Download to PDF