

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Sensors and Technology (3)

Author: Ms. Daria Stepanova

German Orbital Systems GmbH, Germany, daria.stepanova@orbitalsystems.de

Mr. Daniel Wischert

Space Generation Advisory Council (SGAC), Germany, daniel.wischert@spacegeneration.org

Ms. Kiran Mankame

Space Generation Advisory Council (SGAC), United States, kiranmankame10@gmail.com

Mr. Bruce Clarke

Imperial College London, United Kingdom, bruce.clarke@community.isunet.edu

Mr. Jorge Rubén Casir Ricaño

Bauman Moscow State Technical University, Russian Federation, jo.casir@gmail.com

Mr. Hamzeh Issa

Khalifa University of Science and Technology (KUST), United Arab Emirates, hamzeh.issa@ku.ac.ae

Mr. Anoop Kiran

Space Generation Advisory Council (SGAC), United States, anoopkir@buffalo.edu

Mr. Harrish Joseph

Italy, harrishjagan@gmail.com

Ms. Priyanka Ghatole

Space Generation Advisory Council (SGAC), India, priyankaghatole1997@gmail.com

SMALL SATELLITES POTENTIAL FOR GREENHOUSE GAS AND CO2 MONITORING

Abstract

Carbon dioxide (CO₂) levels and other greenhouse gases (GHG) in the atmosphere are rising to new records. To address this climate emergency, recovery plans need to trigger long-term systemic shifts that will change the trajectory of CO₂ levels in the atmosphere. The efficiency improvement of the emissions monitoring can be driven by advancement in data collection processes and diversification of resources and monitoring tools. Today, data about GHG and CO₂ emissions is collected using the big satellite capabilities and on-Earth sensors networks. Small satellites can improve the global emission mapping coverage and image update rates, which will improve the understanding of the CO₂ and GHG dynamics. Today there are several small satellite missions carrying hyperspectral Short-Wave Infrared Imaging (SWIR) imaging instrumentation, providing gas emissions data. However, alternative missions, instrumentation combinations and satellite architectures are possible. This paper aims to analyse the requirements for the emission sensing instrumentation for the installation on the small satellite platform. It is reviewed together with small satellite platform architecture and the use cases. From that, the rational mission profile for small satellite utilisation for the monitoring is derived.