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Satellite-based O&G emitter detection and analysis in Algeria

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Algeria is one of the world's largest oil and gas (O&G) producers and exporters and a major emitter of methane from its O&G extraction and transportation activities. In recent years satellites have proven to be a key tool for detecting point emitters on a global scale. The TROPOMI sensor onboard Sentinel 5P provides a daily large-scale view, and recent advances allow pinpointing single emitters with high spatial resolution sensors.

In this study, we aim to understand and identify methane emission sources in Algeria using satellites as a tool to obtain continuous and objective information from the whole study area. We have used the synergy between different satellites to detect and analyze Algeria's point emitters. We have combined low spatial resolution TROPOMI data with high-resolution images from PRISMA and ZY1-AHSI hyperspectral satellites and Sentinel-2, Landsat 8, and WV3 multispectral satellites. We have identified about 60 point emitters spread over different O&G fields, of which the vast majority are flares venting gas. In addition, we have analyzed the persistence in time of the emitters identified in the most recent years (2017-present) by observing them in the past years with the Landsat constellation historical image record (1984-present). The results obtained so far show a wide diversity in the persistence of emission over time, from facilities emitting for decades to active flares that occasionally deactivate and vent gas.