



Spectral Sizing of a Satellite-Borne CO₂ Sensor to Monitor Localized Emissions

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Objective monitoring of anthropogenic greenhouse gas emissions on a global scale is essential to verify the progress of many governments' efforts to meet the goals of the Paris agreement. Space based observations of single carbon dioxide point sources would establish the means to review CO₂ emission inventories reported to the public. We present a sensitivity study for a satellite-borne spectrometer that would be able to measure CO₂ column mixing ratios with a higher spatial resolution (~ 100 m) than all current and planned satellite missions targeting CO₂ concentrations because of its lower spectral resolution. To this end we degrade GOSAT [0,1] measurements with a spectral resolution of ca. 0.24 cm^{-1} up to resolutions of 10 cm^{-1} . The RemoTeC algorithm [2] is used to investigate the impact of lower spectral resolution as well as different spectral windows and their sizes on XCO₂ retrieval accuracy and we compare the results to benchmark values from the Total Carbon Column Observing Network (TCCON) [3].

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