

## Spectral Sizing of a Satellite-Borne CO<sub>2</sub> 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 CO<sub>2</sub> emission inventories reported to the public. We present a sensitivity study for a satellite-borne spectrometer that would be able to measure CO<sub>2</sub> column mixing ratios with a higher spatial resolution ( $\sim 100$  m) than all current and planned satellite missions targeting CO<sub>2</sub> concentrations because of its lower spectral resolution. To this end we degrade GOSAT [0,1] measurements with a spectral resolution of ca.  $0.24\text{ cm}^{-1}$  up to resolutions of  $10\text{ cm}^{-1}$ . The RemoTeC algorithm [2] is used to investigate the impact of lower spectral resolution as well as different spectral windows and their sizes on XCO<sub>2</sub> retrieval accuracy and we compare the results to benchmark values from the Total Carbon Column Observing Network (TCCON) [3].

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