



## **The CarbonSat Earth Explorer 8 candidate mission: Error analysis for carbon dioxide and methane**

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CarbonSat is one of two candidate missions for ESA's Earth Explorer 8 (EE8) satellite to be launched around 2022. The main goal of CarbonSat is to advance our knowledge on the natural and man-made sources and sinks of the two most important anthropogenic greenhouse gases (GHGs) carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) on various temporal and spatial scales (e.g., regional, city and point source scale), as well as related climate feedbacks. CarbonSat will be the first satellite mission optimised to detect emission hot spots of CO<sub>2</sub> (e.g., cities, industrialised areas, power plants) and CH<sub>4</sub> (e.g., oil and gas fields) and to quantify their emissions. Furthermore, CarbonSat will deliver a number of important by-products such as Vegetation Chlorophyll Fluorescence (VCF, also called Solar Induced Fluorescence (SIF)) at 755 nm. These applications require appropriate retrieval algorithms which are currently being optimized and used for error analysis. The status of this error analysis will be presented based on the latest version of the CO<sub>2</sub> and CH<sub>4</sub> retrieval algorithm and taking the current instrument specification into account. An overview will be presented focusing on nadir observations over land. Focus will be on specific issues such as errors of the CO<sub>2</sub> and CH<sub>4</sub> products due to residual polarization related errors and errors related to inhomogeneous ground scenes.