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Sentinel-2 moving truck detection for traffic density and trace gas emission quantification

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Abstract

We present a new Sentinel-2-based moving truck detection method with potential for economic indicators and traffic emission derivation. Traffic monitoring based on remote sensing data has mostly been limited to local methods using air- and spaceborne data at very high spatial resolutions. However, motion and altitude parallax effects of optical Sentinel-2 data have yet been exploited for airplane and ship detection. The new Sentinel-2-based approach enables to detect moving vehicles on roads, predominantly trucks. The method has been operationalized already in the ESA/European Commission Rapid Action on Coronavirus and EO (RACE) dashboard for depicting economic impacts of the COVID-19 pandemic. Recently, the method has been enhanced for approximating traffic trace gas emissions. Sentinel-2 moving truck detection offers new potential in particular in areas where other traffic emission data sources are sparse.