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Assessment of 10m Spectral and Broadband Surface Albedo Products from Sentinel-2 and MODIS data

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In Song et al. (2021) [1] a framework for the retrieval of 10 m and 20 m spectral and 20 m broadband surface albedo products was described. This framework consists of four modules: 1) a machine learning based cloud detection method, Spectral ENcoder for SEnsor Independence (SEnSel) [2]. 2) an advanced atmospheric correction model Sensor Invariant Atmospheric Correction (SIAC) [3]. 3) an endmember-based class extraction method, which enables the retrieval of 10 m/20 m albedos based on a regression between the MODIS Bidirectional Reflectance Distribution Function (BRDF) derived surface albedo and Sentinel-2 surface reflectance resampled to MODIS resolution. 4) a novel method of using the MODIS BRDF prior developed within the QA4ECV programme (<http://www.qa4ecv.eu/>) to fill in the gaps in a time series caused by cloud obscuration. We describe how ~1100 scenes were processed over 22 Sentinel-2 tiles at the STFC JASMIN facility. These tiles spanned different 4 month time periods for different users with a maximum of 22 dates per tile. These tiles cover Italy, Germany, South Africa, South Sudan, Ukraine and UK for 6 different users. For the Italian site, a detailed analysis was performed of the impact of this hr-albedo on the fAPAR and LAI derived using TIP [5] whilst a second user employed a method described in [6] to compare MODIS and Sentinel-2 and a third user looked at the impact on agricultural yield forecasting. Lessons learnt from these different applications will be described including both the opportunities and areas where further work is required to improve the data quality.

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