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Validating GEOV1 products over the 1998-2010 period using the OLIVE tool (On LIne Validation Exercise)

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Continuous and consistent monitoring of structural characteristics of vegetation such as LAI, fAPAR were recognized as Essential Climate Variables (ECV) which provide key information for the understanding and modeling of canopy functioning and the quantification of carbon fluxes and pools. Global remote sensing observations at medium resolution are routinely acquired since the 80's mainly with AVHRR, SEAWIFS, VEGETATION, MODIS and MERIS sensors. Several operational products have been derived from these observations to provide global maps of these ECVs at daily to monthly time steps. Rather than generating an additional product from scratch, the version 1 of GEOLAND2 (GEOV1) products was capitalizing on the existing products by combining MODIS and CYLOPES product to enhance their pros and limit their cons described in different inter-comparison papers.

This study evaluates the performances of the GEOLAND2, version 1 products in comparison with other existing ones (MODIS, CYCLOPES) over the 1998-2010 period.

This validation exercise is achieved thanks to the OLIVE platform (On Line Interactive Validation Exercise). The OLIVE system enables transparent and traceable validation and inter-comparison of EO land products. The ultimate objective of OLIVE is to provide the user community consistent and reliable information on the accuracy and associated uncertainty of EO products. The validation exercise follows the guidelines proposed by CEOS/LPV and allows for regular updates when new versions or products are available. The validation process requires product extracts of 49x49 pixels over two datasets: BELMANIP2 (BEnchmark Land Multisite ANalysis and Intercomparison of Products) and DIRECT (collection of 113 sites for which ground measurements were processed according to the CEOS-LPV guidelines). BELMANIP2 is used to analyze the product missing data (spatially and temporally), site temporal profiles, the smoothness of the products, as well as the temporal and spatial stability of the products. It also provides some statistical distributions and scatterplots between product per biome type and per continent. Finally, the products are compared against ground measurements over the DIRECT sites.

Results show that GEOV1 products have a good quality, showing a spatial consistent global distribution of retrievals. Temporal profiles are very smooth and are highly consistent from year to year. Comparison with ground data shows that targeted accuracy is achieved. Further, GEOV1 LAI outperforms CYCLOPES LAI for dense canopies, showing the same good performances as MODIS while it provides smoothed temporal profiles as the CYCLOPES ones.