



Ensembles of satellite aerosol retrievals based on three AATSR algorithms within aerosol_cci

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Ensemble techniques are widely used in the modelling community, combining different modelling results in order to reduce uncertainties. This approach could be also adapted to satellite measurements.

Aerosol_cci is an ESA funded project, where most of the European aerosol retrieval groups work together. The different algorithms are homogenized as far as it makes sense, but remain essentially different. Datasets are compared with ground based measurements and between each other. Three AATSR algorithms (Swansea university aerosol retrieval, ADV aerosol retrieval by FMI and Oxford aerosol retrieval ORAC) provide within this project 17 year global aerosol records. Each of these algorithms provides also uncertainty information on pixel level.

Within the presented work, an ensembles of the three AATSR algorithms is performed. The advantage over each single algorithm is the higher spatial coverage due to more measurement pixels per gridbox. A validation to ground based AERONET measurements shows still a good correlation of the ensemble, compared to the single algorithms. Annual mean maps show the global aerosol distribution, based on a combination of the three aerosol algorithms. In addition, pixel level uncertainties of each algorithm are used for weighting the contributions, in order to reduce the uncertainty of the ensemble.

Results of different versions of the ensembles for aerosol optical depth will be presented and discussed. The results are validated against ground based AERONET measurements. A higher spatial coverage on daily basis allows better results in annual mean maps. The benefit of using pixel level uncertainties is analysed.