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A New CCI ECV Release (v2.0) to Accurately Measure the Sea Level Change from space (1993-2015)

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Accurate monitoring of the sea level is required to better understand its variability and changes. Sea level is one of the Essential Climate Variables (ECV) selected in the frame of the ESA Climate Change Initiative (CCI) program. It aims at providing a long-term homogeneous and accurate sea level record. The needs and feedback of the climate research community have been collected so that the development of the products is adapted to the users. A first version of the sea level ECV product has been generated during phase I of the project (2011-2013).

Within phase II (2014-2016), the 15 partner consortium has prepared the production of a new reprocessed homogeneous and accurate altimeter sea level record which is now available (see http://www.esa-sealevel-cci.org/products). New level 2 altimeter standards developed and tested within the project as well as external contributions have been identified, processed and evaluated by comparison with a reference for different altimeter missions (TOPEX/Poseidon, Jason-1 & 2, ERS-1 & 2, Envisat, GFO, SARAL/AltiKa and CryoSat-2). The main evolutions are associated with the wet troposphere correction (based on the GPD+ algorithm including inter calibration with respect to external sensors) but also to the orbit solutions (POE-E and GFZ15), the ERA-Interim based atmospheric corrections and the FES2014 ocean tide model. A new pole tide solution is used and anomalies are referenced to the MSS DTU15.

The presentation will focus on the main achievements of the ESA CCI Sea Level project and on the description of the new SL_cci ECV release covering 1993-2015. The major steps required to produce the reprocessed 23 year climate time series will be described. The impacts of the selected level 2 altimeter standards on the SL_cci ECV have been assessed on different spatial scales (global, regional, mesoscale) and temporal scales (long-term, inter-annual, periodic signals). A significant improvement is observed compared to the current v1.1, with the main impacts observed on the long-term evolution on decadal time scale, on global and regional scales, and for mesoscale signals. The results from product validation, carried out by several groups of the ocean and climate modeling community will be also presented.