This data contains the instantaneous dynamic topography of satellite altimetry (SA) and hydrodynamic model (HDM) derived with respect to the NKG2015 geoid model.

The data include the along-track SA observation using the ALES+ retracker for tree SA missions including Sentinel-3B, Sentinel-3A, and Jason-3 20HZ data over the year 2016-2019 over the Baltic Sea.

These data include the corrected HDM data using the tide gauge (TG) measurements along each SA pass at the same time of the SA cycle. The correction method and process have been explained in the paper "Determination of Accurate Dynamic Topography for the Baltic Sea using Satellite Altimetry and a Marine Geoid Model" by Mostafavi M., et. al.,2023

The correction of HDM data has been done using 73 TG stations (all TG data records vertical datums are harmonized with EVRS2000 using Baltic Sea Chart Datum 2000, BSCD2000 also the vertical land motion correction has been applied using the NKG2016LU model) observation at the time and location of SA pass/cycles.

The data also include the dynamic atmospheric correction (DAC) from a model (available in original Baltic+SEAL data).

The NKG2015 gravimetric quasi-geoid model, geoid height (referred to Geodetic Reference System GRS80 ellipsoid) is also included at each SA data point using linear interpolation (which can alternatively be added to both SA and HDM to retrieve Sea Surface Height with respect to GRS-80 reference ellipsoid).

All SA mission data transferred from Topex/Poseidon to GRS-80 reference ellipsoid and in zero tide system, also, gross errors and outliers have been removed from the dataset using the method explained in the same paper.

The SA-derived DTs are available in two terrestrial reference systems: ITRF2008 (original SA system) by name of dt\_sa and ETRF at the time epoch of each SA cycle, named by dt\_sa2 (which can be compared with TG observations). The transformation method is also explained in the paper.

The Time of data is the DateTime format (the year, month, and season number are also included)

The pass and cycle number of each SA data is also mentioned.

Variables descriptions and units:

* Lon: Longitude [decimal degree]
* Lat: Latitude [decimal degree]
* Time [date time format: DD-MM-YYYY HH:MM:SS]
* Year
* Month
* Season
* Cycle: SA cycle number
* Pass: SA orbit ground pass number
* dac: Dynamic Atmospheric Correction [cm]
* NKG2015: geoid height [m]
* hdm\_dt: corrected Hydrodynamic Model derived Dynamic Topography [cm]
* sa\_dt: satellite altimetry derived dynamic topography (in original ITRF2008 system) [cm]
* sa\_dt2: satellite altimetry derived dynamic topography (in ETRF system at the epoch of each SA cycle; TIME) [cm]
* sa\_mision: Satellite Altimetry mission name (S3B, S3A or JA3)

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