



Changes in satellite-based cloudiness in the Baltic Sea region during spring and summer 1982 – 2015

Piia Post (1) and Margit Aun (2)

(1) University of Tartu, Institute of Physics, Tartu, Estonia (piia@ut.ee), (2) University of Tartu, Tartu Observatory, Tartu, Estonia

Cloudiness and solar radiation at the surface have had remarkable inter-annual and inter-decadal variations and no clear tendencies over the Baltic Sea region (BACC 2008, BACC 2015). The decrease in cloudiness and increase in sunshine duration was observed in the south while opposite trends revealed in the north. Similarly, to average European tendencies in the 1990s, all these trends turned their sign. The reversing of the decreasing trend in atmospheric transparency and direct radiation in 1990s is associated with air quality improvement due to less aerosol emissions (Ohvri et al., 2009).

But, the assessments of trends and variability of cloud cover in the Baltic Sea region rely almost entirely on total cloud cover as “measured” by eye-observations at synoptic stations (BACC 2008, 2015). The papers about the trends of solar radiation and cloud parameters in Europe from satellites often restrict with 60 N due to limitations in the quality of data over higher latitudes (Pfeifroth, et al., 2017, 2018). At the same time, Northern Europe is a region of large positive trends of cloud properties in CMIP5, but also the region where majority of observations and CMIP5 results do not agree (Norris et al., 2016).

Lately, several new satellite-based climate data records are released: the CM SAF CLARA-A2 (Karlsson et al., 2017), CLAAS-A2 (Finkensieper, et al., 2016); COMET (Stöckli et al 2017) ESA cloud_CCI (Stengel et al., 2017), that include high resolution cloud macro- and micro-physical properties. Based on these data records, an analysis of cloud property changes over the Baltic Sea region during 1982 – 2015 was performed.