The EUSTACE break-detection algorithm for a global air temperature dataset

Yuri Brugnara (1,2), Renate Auchmann (1,2), Stefan Brönnimann (1,2)

(1) Oeschger Centre for Climate Change Research, Bern, Switzerland, (2) Institute of Geography, University of Bern, Bern, Switzerland

EUSTACE (EU Surface Temperature for All Corners of Earth) is an EU-funded project that has started in 2015; its goal is to produce daily estimates of surface air temperature since 1850 across the globe for the first time by combining surface and satellite data using novel statistical techniques.

For land surface data (LSAT), we assembled a global dataset of ca. 35000 stations where daily maximum and minimum air temperature observations are available, taking advantage of the most recent data rescue initiatives.

Beside quantity, data quality also plays an important role for the success of the project; in particular, the assessment of the homogeneity of the temperature series is crucial in order to obtain a product suitable for the study of climate change.

This poster describes a fully automatic state-of-the-art break-detection algorithm that we developed for the global LSAT dataset. We evaluate the performance of the method using artificial benchmarks and present various statistics related to frequency and amplitude of the inhomogeneities detected in the real data. We show in particular that long-term temperature trends calculated from raw data are more often underestimated than overestimated and that this behaviour is mostly related to inhomogeneities affecting maximum temperatures.