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Efficient use of the results of the previous homogenization in the regular updates

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Homogenization of the data series raises the problem that how can we update the earlier homogenized data series without starting from beginning. Another question is how to homogenize together the long and short data series, since in the last decades the meteorological observation system was upgraded significantly.

It is possible to solve these problems with method MASH (Multiple Analysis of Series for Homogenization, Szentimrey), since it is based on adequate mathematical principles for these purposes. MASH is based on hypothesis testing, so we can examine the null-hypothesis of homogeneity of the new system by statistical tests. At MASH only minimal adjustments are used based on confidence intervals estimated for the break points and shifts too. MASH is an iteration procedure, the series are examined and adjusted many times, therefore the re-homogenization of the new system can be considered as a continuation of the earlier homogenization procedure. We use all the raw data and the earlier detected inhomogeneities (break points, adjustments) together (instead of the earlier homogenized series) since the break points and adjustments are very useful information for further homogenization. Moreover this re-homogenization is the continuation of the earlier homogenization process was executed according to the principle of MASH.

When the station network is upgraded and we have short data series besides the long series, the common section must be homogenous together with the long as well as with the short data series, while the two systems have to be homogenous on their own too. MASH is able to solve this, as it is based on hypothesis testing and it is an iteration procedure. We synchronize the common part's inhomogeneities within two different MASH processing.

In the last few years we have managed the updating and upgrading the homogenized records efficiently and easily by using MASH at Hungarian Meteorological Service.