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COST733CAT - a new database of circulation type classification catalogues for Europe

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In order to study differences of methods for weather and circulation type classification a database of classification catalogues has been created by working group 2 of the COST Action 733 „Harmonisation and Applications of Weather Type Classifications for European regions“. 17 different automated classification methods have been applied to ERA40 data in a number of variants while 8 subjective or non-scalable methods have been added for comparison.

Comparison of methods requires to unify the boundary conditions as much as possible and only to vary the classification procedure itself. Therefore at least for one version of each automated method the input data set has been fixed to 12 well defined European spatial domains of different scale, to daily MSLP ERA40 data in the period 09/1957 to 08/2002 using the full year sample and default numbers of types 9, 18 and 27 have been used where possible.

From the conceptional point of view four different groups of automated methods may be discerned concerning the definition of types and their key patterns:

1.) types are defined by arbitrary thresholds,

2.) key patterns are selected by frequencies of similar patterns (Leader alogithm),

3.) the definition of the types is an outcome of an optimisation algorithm (e.g. cluster analysis) and

4.) key patterns are defined by (s-mode or t-mode) principal component analysis.

Even this grouping might suggest that the resulting classification catalogues are more similar within one conceptional method group, it is shown that there are large non-systematic discrepancies. While resulting circulation type patterns show some similarity, the partitionings of daily patterns show only low agreement between the methods. This raises questions about the classifiability of the circulation data which are further discussed.