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The effect of length and starting year on trend analyses of temperatures in Spanish mainland (1951-2010). A general approach (I)

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One of the most interesting issues in climate analyses of trend is the comparison between different results. This is a difficult task not only because of different spatial density of information, or data format (raster or station), but also because they usually analyze different temporal periods, sometimes differing only in few years, and trend of time (climate) variables can vary dramatically accordingly length of period and starting year (Lüdecke et al., 2011).

In this poster we present the global frame of an approach that during the last years has attracted the attention of some researchers: the moving windows analyze. Basically it consists in calculate the trends for all the possible period, combining length and starting year in any given series of climate variables. The analysis obviously only can be applied to one series of data (i.e. one station), and the results are usually presented in triangular diagrams. This approach has been applied to regional, national or global series both to temperature and precipitation (Brunetti et al., 2006; Liebmann et al., 2010; González.Hidalgo et al. 2010, 2016, between others).

The spatial differences in the behavior of temperatures and precipitation during the last year has been noticed in many research, particularly when high density of stations has been used, so the question is how to use this approach in dozens, hundreds or thousands of stations? We present in this poster example of graphical analyses of moving windows, how to read the graphs, the possibility that this analyses offers, etc. In a sequence of posters the analyze is applied to a high-resolution grid of monthly temperatures of Spanish mainland, MOTEDAS dataset (1951-2010), at season and monthly temporal scale (see Winter-II, Spring-III, Summer-IV and Autumn-V Posters).

To apply the approach we have used an ergodic transformations from time (each temporal series) to space (all the series in the same period), i.e. we present the results of season and monthly mean values of Tmax and Tmin trends by showing a collection of maps accordingly changes in period length and starting year.

In the sequence of seasons (see Poster II-III-IV and V), we have selected particularly a decreasing length period from triangular diagram, i.e. from 1951-2010 until 1991- 2010 (the hypotenuse of graphical triangle), thus, we analyze all the possible trends in periods between 60-years and 20-years (considering that 20 years represent a minimum period for detect any climate signal).