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The effect of length and starting year on trend analyses of DTR in Spanish mainland (1951-2010)

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A negative trend for the diurnal temperature range or DTR during the 20th century has been detected on a global scale but from the 1980s, the results published differ from non-significant or positive to negative trend values. This has also happened for Spanish mainland, a subject of study on which many authors have pointed out several reasons of why the trend of DTR is negative, such as anthropogenic causes like greenhouse gases or seasonal differences in cloud cover and insolation.

In this poster, we continue to present our work in relation to the analysis of Spanish mainland temperatures for the period 1951-2010. The objective is to analyze the DTR across Spanish mainland according to the moving windows approach. We have selected particularly a decreasing length period from 1951-2010 and we are going to analyze all the possible trends in periods between 60-years and 20-years (considering that 20 years represent a minimum period for detecting any climate signal).

The database used is the Monthly Temperature dataset of Spanish mainland (MOTEDAS) in its grid format, 5236 pixels of monthly series, which is the highest spatial resolution available until now (10x10 km).

The most striking results are as follow:

- The DTR is indicating a very clear north-south gradient, where the south region is significant and negative, but from the mid-1980s, there is no significance.
- There is a difference between seasonal trends:
  - In general, the three months of winter (December, January and February) and the three months of spring (March, April and May) do not report that there has been a change in DTR, moreover, it is indicating that, in general terms especially in the last decades, the minimums have been higher than the maximums. With the exception of February for 1966-1977, where especially in the northwest there is with variable percentages in a significant and positive way, some sectors in which the maximums increase more than the minimums.
  - Meanwhile in summer and autumn there are higher negative values and a clear spatial distribution of the results, the difference between north-south. The months of July, August and September have a more similar pattern than June, the month that has traditionally been assigned to the summer.