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Changes in the seasonal cycle in European temperature observations

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One of the constants in life is the change of weather along with the seasons. The European temperatures exhibit such a seasonal cycle, warm summers and cold winters. The period of this cyclic behaviour is fixed at one year; not fixed is the shape of this periodic function nor the type or pattern of temperature alteration resulting from a changing climate. A spatially differentiated picture of when in the year a temperature change takes place or is to be expected, is, however, the basis for planning options of local decision makers. We analyse the variations in amplitude and shape of European temperature observations for different time periods using non-parametric exploratory techniques, as well as a harmonic analysis. The pattern or type of change in the seasonal cycle partially depends on the geographic position but also on the time period when the change takes place. For example, in the first half of the last century, temperature increase is predominantly found in summer, whereas the increase in the second half dominated during the winter months. We analyse such patterns of change in space and time in order to link them to specific climatic factors, such as a reduced snow cover.