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Changes in the atmospheric dynamics leading to European heatwaves during the last century

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Summer hot temperatures have many impacts on health, economy (agriculture, energy, transports) and ecosystems. In western Europe, the recent summers of 2003 and 2015 were exceptionally warm. Many studies have shown that the genesis of the major heat events of the last decades was linked to anticyclonic atmospheric circulation and to spring precipitation deficit in southern Europe. Such results were obtained for the second part of the 20th century and projections into the 21st century.

We challenge this conceptual model by investigating the earlier part of the 20th century from an ensemble of 20CR reanalyses. We propose an innovative description of Western-European heat events. We argue that the atmospheric circulation patterns leading to the most intense heat events have changed during the last century.