



Variability of intensification mechanisms of extra-tropical cyclones analysing ERA20C reanalysis

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European winter windstorms and corresponding severe extra-tropical cyclones undergo strong inter-annual to decadal variability. Mechanisms leading to these variabilities are still not fully understood. Recent studies discuss the role of the state of the North Atlantic (NA), its variability of heat content and meridional temperature gradients concerning storm variations on decadal time scales. During the 20th century, changes of NA sea surface temperature can be attributed to a warming trend as well as the Atlantic multidecadal variability (AMV) with cold conditions in the 70s to 90s and warm conditions in the recent decade. This leads to variabilities of favoring development conditions for severe European windstorms.

This study investigates the variability of mechanisms leading to an intensification of extra-tropical cyclones in ERA20C reanalysis data from 1960 to 2010. Extra-tropical cyclones are identified with an objective tracking scheme. The pressure tendency equation is evaluated to analyse diabatic and baroclinic contributions of each individual cyclone. Climatologies of the relative development contributors are presented for the 50 year dataset.