

## **P51 Wind jump in extra-tropical cyclones**

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Fast moving extra-tropical cyclones frequently contain a small area in the wake of the cold front where severe non-convective winds (wind jump) occur. In this area, the pressure suddenly increases significantly from its minimum value. It is not clearly known which processes are responsible for the “wind jump” and information from literature is lacking. It is clear that these extreme winds are influenced by ageostrophic effects, but the question is which effect(s) is(are) responsible for the “wind jump”.

Numerical weather prediction models have problems with resolving the “wind jump”, because of its small-scale character. The simulated severe winds (averaged over a short time range) can be underestimated up to 1 Beaufort, and as a consequence, meteorologists usually add 1 Beaufort when issuing warnings for dangerous wind gusts.

MeteoGroup has investigated whether WRF is able to resolve the “wind jump”, and to uncover the underlying physical processes. The simulation results confirmed that a horizontal resolution of ~10 km or finer, resolves the “wind jump”, but only when the storm is present at the model initialization time. A detailed analysis revealed that the development of this phenomenon can only be explained by a combination of ageostrophic winds.