HOW DO STATISTICS OF THE MEAN WIND CORRESPOND TO EXTREME WIND STATISTICS OVER THE BALTIC SEA?

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Abstract
We investigate whether direction-related statistics of extreme wind events follow statistics of mean wind and thus whether changes in mean wind statistics can be used to approximate extreme wind changes. This study shows that this hypothesis is not valid over the Baltic Sea region.
The focus lies at differences and changes of wind directions. Furthermore there are contrasts between seasons.

Differences in both wind direction distributions are detected. Main direction for extremes is from South-West (SW) whereas for the mean wind all directions can be found. The distribution of extreme wind directions shows a limited spread around SW.
These distributions are not just different for mean and extreme but additionally across seasons. The main direction remains SW but deviating from this mean winds in springtime occur as often from SW as from NE. Extreme winds are clearly focused from west with a stronger influence of SW. Easterly wind seems to play a minor role in extreme wind statistics.
The spatially covariance of wind statistics are further investigated by an EOF- analysis, which shows seasonally independent patterns of wind direction variability. Extreme winds are mainly westerlies, thus their variability is limited to north-south directions. These variability patterns show no trends in time and are quite homogeneous over the whole region.
The results show that mean wind is not a good indicator for the main direction of extreme wind.