A Comparison of Two Tracking Methods on Polar Lows

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Abstract:

In this study we investigate the ability of two different cyclone tracking algorithms to detect polar lows, very intense mesoscale cyclones, in the North Atlantic area. The first method by M. Zahn (2008) bases on the digital bandpass filtered MSLP-fields in the spatial range 200~600km and is especially designed for polar lows. The second method is of K. Hodges (1995) also using a bandpass filter in the same spatial range but based on the discrete cosine transforms (DCT) and applied to MSLP and vorticity fields. The latter was originally designed for cyclones in general and we adapt it for the specifics of polar lows for this study. Both algorithms are applied to the same RCM output fields gained from dynamical downscaling the NCEP/NCAR reanalysis data. The two algorithms are compared to see which same polar lows are identified by both methods and which are not. The contrast between using MSLP and vorticity will be discussed. The reasons for differences are also studied.