



Toward the climatological study of polar lows over the Japan Sea

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Satellite imagery shows that meso-alpha-scale polar lows develop over the Japan Sea during cold air outbreaks in winter, which usually occur to the west of synoptic-scale extratropical cyclones. To understand the climatology of polar lows over the Japan Sea, we use satellite imagery and a reanalysis dataset.

We used nephanalysis charts of the Japan Meteorological Agency, which shows 3-hourly locations of lower-tropospheric meso-scale vortices. For 6 winter seasons (Dec. 1997 – Feb. 2003), 81 polar low candidates are detected over the Japan Sea. We will show the geographical distribution and some remarkable polar low cases.

We also examine whether the Japanese 55-year reanalysis (JRA-55) is useful for the climatological study of polar lows. The sea level pressure field of JRA-55 represents signals of intense polar lows. The spatial filter for meso-scale cyclones and tracking algorithm of Hodges (1995) successfully detected intense polar lows over the Japan Sea.