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CLIMATOLOGY OF POLAR LOWS OVER THE JAPAN SEA USING THE JRA-55 REANALYSIS

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A polar low (PL) is a meso-alpha-scale cyclone over the high-latitude oceans during winter. We analyzed climatology of PLs over the Japan Sea using the JRA-55 reanalysis, because a number of previous studies have reported PL formation there. JRA-55 uses global-spectral model with horizontal grid spacing of ~60 km, which seems to resolve formation of PL. PLs are detected by the minimum of sea level pressure in T40-T100-filtered fields, and are tracked using the algorithm of TRACK-1.4.3 (Hodges, 1995, 1999). Based on the methodology of Zappa et al. (2014), PLs are identified by the temperature difference of 43 K between sea surface and 500 hPa.

The above methodology is applied for the extended winter season (Oct-Mar) from Oct. 1981 to Mar. 2014. The tracking analysis of JRA-55 shows PL tracks over the Japan Sea, which is similar to satellite observation. Composite fields at the time of the PL formation show intensified cold-air outbreak from Asian Continent due to transient extratropical cyclones to the east of the Japan Sea.

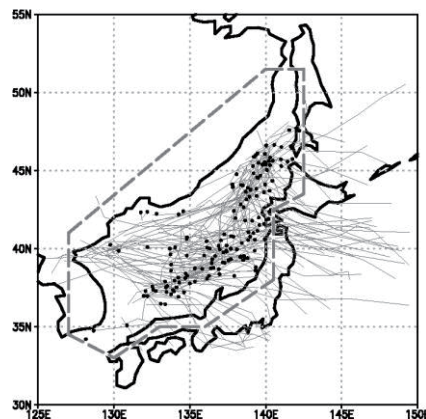


Fig. 1: tracks of PLs identified in the JRA-55 reanalysis.