



## **Analysis on seasonal retreat of Siberian high in association with that of the extremely cold Siberian air mass from winter to spring**

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According to Kato et al.(2009), the seasonal increase in surface air temperature in the Japan Islands area attains the maximum due to the rapid weakening of the winter time large-scale circulation pattern from late March to early April. Although the rapid decrease in the appearance frequency of the daily Siberian high at that time was pointed out by them, seasonal retreat process of the the Siberian high and the Siberian air mass including in the their day-to-day variations from winter to spring have not been systematically understood yet. Thus the present study will examine the above phenomena by using mainly the NCEP/NCAR reanalysis data and the daily weather maps at the surface level provided by JMA. Although the climatological analyses are need in the future, the present study will perform a case study for the several years, 1984(cold winter), 2007(warm winter) and 2011(normal winter).

The area with high appearance frequency of the surface anticyclone with its center pressure more than 1032hPa (roughly corresponding to the Siberian high) was found around 40N~60N/90~120E (including Lake Baykal area (50~55N/105~110E)) in January and February. Interestingly, the latitude of that high appearance area was not so changed in March. Furthermore its frequency decreased rapidly with its maximum latitude unchanged in April.

However, while the high frequency area was mainly located in the colder region with 850hPa temperature (T850) lower than -15 degrees Celsius in January and February wider part of the area with high appearance frequency of the intense anticyclone distributed in the baroclinic zone with T850 higher than -15 degrees Celsius. In April, the -15 degrees Celsius isotherm of T850 moved further northward to ~60N, although the maximum frequency of the anticyclone was seen along ~50N. In addition, although the anticyclone associated with the daily Siberian high showed rather quasi-stationary-like character also in March (as well as in midwinter), the storm track was also found along that latitude to the east of ~110E at that time. As such, the present study implies that the frequent appearance area of the daily Siberian high changes in its relative location to the extremely cold area or the large temperature gradient zone to the south of it from winter to spring.