

Diagnosis of the atmospheric circulation in winter 2007/08
focusing on unusually strong Siberian high and cold surges over Asia

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In the 2007/2008 winter season, due to the third strongest La Niña since 1949, the atmospheric circulation anomaly pattern associated with its influence was dominant mainly in tropical regions.

- The convective activities were enhanced around Indonesia, the South China Sea, the Philippines and SPCZ, while inactive in the western and central Pacific Ocean.
- In the upper troposphere, anti-cyclonic circulation anomalies were analyzed from Middle East to East Asia and the same in the Southern Hemisphere. In the Pacific Ocean, there was a pair of cyclonic circulation anomalies across the equator.
- In the lower troposphere, a pair of cyclonic circulation anomalies across the equator was analyzed in the Indian Ocean, while anti-cyclonic circulation anomaly was dominant in the Pacific Ocean.
- At middle and high latitudes in the Northern Hemisphere, the reverse PNA pattern was dominant.

These features persisted through this winter.

In contrast, the Siberian high was rather weaker than climatology in December. In mid-January, it strengthened rapidly and persisted until mid-February. It was the strongest Siberian high from 1979 using JRA-25 re-analysis data.

As the correlation between the strength of the Siberian high and La Niña is not significant statistically and its feature changed from the former to the latter season, the relationship between the development and persistence of the Siberian High and the La Niña event is not evident.

There is a possibility that a ridge which propagated westward through the Arctic Ocean coast with the approach of a ridge which propagated easterly from West to Central Siberia was related to the development of this Siberian high pressure system. A ridge of Central Siberia intensified by the propagation of the quasi-stationary Rossby wave packet from the Europe related to the maintenance of the Siberian high, and it may be said that it was maintained by mechanism of the " wave-train (Atlantic-Origin) type" (Takaya and Nakamura 2005).

The verifications of our numerical prediction system will be described in the presentation.