

Storm Tracks and Low-Frequency Variabilities in AFES-LETKF Experimental Ensemble Reanalysis 2

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An experimental ensemble atmospheric reanalysis dataset is being produced with a data assimilation system composed of the atmospheric general circulation model for the Earth Simulator (AFES) and the local ensemble transform Kalman filter (LETKF) [1]. The system has been updated from that produced ALERA (AFES-LETKF experimental ensemble reanalysis), hence the dataset is called ALERA2 [2]. The period of the ALERA2 is about five year, which is from 1 January 2008 to 31 December 2012, covered by two streams: one from 1 January 2008 and the other from 1 August 2010.

Winter periods of the five-year-long dataset in Northern Hemisphere are used to investigate the relationship between storm tracks and low-frequency variabilities such as blocking. The investigation is especially focused on the behavior of the analysis ensemble spread [3].

The climatology of the ALERA2 in those periods is almost similar to an operational reanalysis dataset, the JRA-25/JCDAS [4], in the upper troposphere where the low-frequency variabilities are dominant. Also, storm tracks in these reanalysis datasets show good agreement.

It is found that the large structure and time variation of the analysis ensemble spread are concentrated near the storm-track regions, especially on North and middle Pacific. Also, the time evolution of the spread is related to those of the storm track and the blocking-like pattern in the North Pacific region.

References

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