

AFES–LETKF Experimental Ensemble Reanalysis 2

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An atmospheric reanalysis dataset has been constructed with the atmospheric general circulation model for the Earth Simulator (AFES) and the local ensemble transform Kalman filter (LETKF)[1]. It is a successor of AFES–LETKF experimental ensemble reanalysis (ALERA)[2], hence called ALERA2. This dataset provides six-hourly 63-member analyses and their ensemble mean and spread for five years from 1 January 2008 to 9 January 2013.

ALERA2 takes advantage of improvements of the forecast model and the data assimilation code. With the updated physical packages, AFES has improved forecast skills in spite of a slightly coarser horizontal resolution of 1°. Distance-based covariance localization[3] is used in LETKF to remove inconsistencies of the analysis ensemble spread near the poles.

Observations are obtained from the NCEP PREPBUFR archive of UCAR. In addition to analyzed variables, ALERA2 includes variables diagnosed in the forecast model such as precipitation and surface fluxes.

ALERA2 is used as the reference of observing system experiments for field campaigns conducted by JAMSTEC. For example, OSE's were conducted to evaluate radiosonde observations from a research vessel *Mirai* in the Arctic in 2010[4]. With the radiosonde observations, the tropopause folding associated with a cyclone is better represented. Radiosonde observations have not only local but also remote influences on the Northern Hemisphere mid-latitudes.

References

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