



A New Quality Control Method base on IRMCD for Wind Profiler Observation towards Future Assimilation Application

Min Chen and Yu Zhang

Institute of Urban Meteorology, Beijing, CMA

A wind profiler network with a total of 65 profiling radars was operated by the MOC/CMA in China until July 2015. In this study, a quality control procedure is constructed to incorporate the profiler data from the wind-profiling network into the local data assimilation and forecasting system (BJRUC). The procedure applies a blacklisting check that removes stations with gross errors and an outlier check that rejects data with large deviations from the background. Instead of the bi-weighting method, which has been commonly implemented in outlier elimination for one-dimensional scalar observations, an outlier elimination method is developed based on the iterated reweighted minimum covariance determinant (IRMCD) for multi-variate observations such as wind profiler data.

A quality control experiment is separately performed for subsets containing profiler data tagged in parallel with/without rain flags at every 00UTC/12UTC from 20 June to 30 Sep 2015. From the results, we find that with the quality control, the frequency distributions of the differences between the observations and model background become more Gaussian-like and meet the requirements of a Gaussian distribution for data assimilation. Further intensive assessment for each quality control step reveals that the stations rejected by blacklisting contain poor data quality, and the IRMCD rejects outliers in a robust and physically reasonable manner.