"Twin-analysis" verification: a new verification approach that alleviates pitfalls of "own-analysis" verification when applied to short-range forecasts

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Abstract

In operational NWP, forecast verification against analysis from the same experiment is part of the standard evaluation practice. This "own-analysis" verification is beneficial in providing complete spatial coverage but is known to suffer from overly optimistic scores when applied to short-rage forecasts due to the inevitable positive correlation between the forecast and analysis errors.

This issue is particularly problematic when a new development involves assimilation of new observations since the more observations we assimilate, the less correlated the background and the analysis tend to be, leading to apparent degradation in the score which makes interpretation a delicate task.

To alleviate this problem, we propose "twin-analysis" verification in which we produce "twin analyses" by running an independent cycle using the same NWP system as the one used to produce the forecasts, but initializing from an independent first guess and then verify the forecasts against these twin analyses. This way the error correlation between the forecasts and analyses should be reduced while preserving the statistical properties of the analyses, hopefully enabling a clearer interpretation of verification.

In this talk we will report the results of comparison between "twin-analysis" and "own-analysis" verification scores obtained for the JMA's global NWP system. The two scores disagree up to two days, suggesting that "own-analysis" verification is unreliable for such short ranges.

Keywords: verification practice, own analysis verification, analysis incestuousness, inbreeding, global NWP

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