

# Structure and Phase Error Correction of the First Guess with Hybrid 3DV-Ensemble Analysis

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The forecast errors in the first guess include the position, the structure and the amplitude errors. Forecast error structures estimated from the model forecasts and/or previous observations are used to spread the analysis increments to the non-observed area. While this common practice has great success in analysis schemes, it is not effective in removing the structure and position errors. It is found that hybrid 3DV-ensemble analysis with differences between global ensemble mean and regional first guess as ensemble perturbation is effective in removing the structure error in the regional first guess. The same method is also used to remove the position error of the hurricanes. Extra ensemble members were added by locally shifting the first guess near the center of cyclones and the use of the hurricane central pressure observations are enhanced by adding bogus observations near the center of the cyclone.

