

RECENT PROGRESS IN THE APPLICATION OF GPSRO DATA AT THE MET OFFICE

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The status on the operational assimilation of GPSRO at the Met Office will be presented. We will then go on to discuss improvements in the quality-control for 1D-bending angle assimilation. These improvements were attained by rejecting bending angle data when the background exhibits large refractivity vertical gradients typical of the PBL top (generally observed in trade-wind inversion scenarios). In these scenarios COSMIC radio occultation bending angles typically exhibit significant negative biases compared to the forward modelled bending angles. The model can also appear to get the height of the PBL wrong, and due to limitations of the assimilation system the GPSRO data can degrade the analysis i.e. blur-out the inversion. Finally, the bending angle operator becomes highly non-linear in such conditions meaning the tangent-linear approximation, which is applied in our 4D-Var variational assimilation method, can become a poor approximation, leading to convergence problems.

We will present results where increasing bending angle assimilation up to 60 km has improved model biases significantly. These model biases tend to develop at 40-60 km in or near the winter polar vortex (due to spurious background error covariances in the assimilation system). These regions are sparsely sampled by other observations, hence GPSRO can reduce the size of the biases considerably, despite the high noise at these levels.