

Anonymous Referee No.1

Specific comments:

1. The conclusions section provides a good summary of the paper. However, the abstract's brief statement of the recommendation may mislead, since Rosenkranz15, TKC16, and Stogryn95 yielded nearly equivalent improvements.

We agree with the referees comment and amended the manuscript accordingly. Instead of recommending Rosenkranz15 we reworded the abstract to say that we favour Rosenkranz15 in this study because of the reasons named in the last paragraph of the conclusions. p.1 l.9-16

2. The closure experiments described in this paper are based on ECMWF-IFS, and it should be said that other forecast systems could conceivably yield different results.

That is true. The study undertaken is IFS specific. We edited the manuscript to highlight this fact to the reader: p.6 l.10-12

3. In the second paragraph of Section 5 (on p.23), the reasoning is hard to follow. Lines 16-17 state that there is a neutral impact on humidity, temperature and wind. But line 23 says "An improvement seen for ATMS is a result of an improved FG field in humidity..."

The statement in lines 16/17 on page 23 refers to the impact on forecast scores in terms of a change in root-mean-square error in humidity, temperature and wind in the long- and short-term, which was neutral. However, analysis-based verification can be unreliable at short ranges due to correlations between the forecast and the reference, so we would place more reliance on verification against observations here, which is done using the humidity sensitive instrument ATMS (and others). p.22 l.20-22

Technical corrections:

4. page 3, lines 21-23. "Permittivity ... consists of a real (scattering) component, and an imaginary (absorption) component." Actually, both real and imaginary parts of permittivity are involved in scattering and absorption by spherical droplets.

We edited the sentence to: "Permittivity ... consists of a real component, and an imaginary component." p3 l.24/25

5. page 7, lines 16-17. The sentence "The two most recent permittivity models Rosenkranz15 and TKC16 give about 50% of the absorption compared to Liebe89 for frequencies around the 183 GHz water vapour absorption line." belongs under the discussion of Fig.2a for 240K, starting at line 20.

Done. p.7 l.13-15