Interactive comment on “Improved OSIRIS NO$_2$ retrieval algorithm: Description and validation” by Christopher E. Sioris et al.

Anonymous Referee #1

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In this paper a new OSIRIS NO$_2$ retrieval algorithm is presented using a better forward model (and forward model inputs). It is well written and clearly presented. I see only minor technical issues that should be addressed before publication:

1. The second sentence in the Abstract becomes only clear after reading the paper. It could be left as is, if no better formulations come to mind.

2. page 2 line 17: OSIRIS is already defined on page 1 line 17

3. page 9 line 16: Why use 17.5 km?

4. page 12 line 17-21: Why include a climatology only for November and the Southern Hemisphere? What data has been used for this climatology, I presume it
is the new algorithm 2D? Should this figure be included, no mention has been made about it other than that it has been included, because no other data south of 22°S has been used?

5. page 21, table 1: Maybe add references to papers for v3.0 and fast in an additional row?

6. page 24, figure 2: Maybe use 'new algorithm' instead of 'algorithm described above' and add the colours (blue and green) in the figure caption (eg: using the default window (435-477 nm), blue.

7. page 27, figure 5, line 4: add a 'the': 'and the true atmosphere.'