

Reply to co-editor

Co-editor's comment is typed in blue, authors' response is typed in black.

I have one more scientific comment that you may want to consider already, although I do not require any changes now. It may also be addressed in the public discussion later. It relates to the value of your 2-D mixing model

1) Is it realistic to assume an end member with only 5 ppb N₂O in the tropical region?

It is true that the mixing ratio we observed at about 30 km height is much higher than 5 ppb. But at higher altitudes in the middle/higher stratosphere (40–50 km), it would approach to 5 ppb. This can be seen in the 3-D model simulation results (Fig. 8a).

2) Conceptually, you develop an additional model to explain the shape of the curve in mid latitudes, which can already be successfully explained by the 1D model. But your model does not provide any evidence that the epsilon values in the equatorial mid stratosphere, where you present the new data, are so much higher. So in the present text I am not really convinced about the additional value of this simple model. The 3D model result on the other hand is very valuable!

The referee #2 pointed out that the discussion with the 1-D model is misleading and even incorrect. We decided to delete the 1-D model part and leave the discussion with the conceptual 2-D model according to the referee's comment.