

## ***Interactive comment on “Vertical distributions of N<sub>2</sub>O isotopocules in the equatorial stratosphere” by Sakae Toyoda et al.***

**Anonymous Referee #1**

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This paper extends previous measurements and analysis of the vertical distribution of N<sub>2</sub>O isotopocules into the tropical stratosphere. It introduces a new sampling system with a much weight-reduced cryogenic sampler. The measurements are impressively accurate and precise and show systematic differences to previously published mid latitude profiles, with implications for the balance between photolysis and photooxidation of N<sub>2</sub>O, and transport, in determining the vertical distributions. The paper is clearly written and presented. It is well suited to ACP and I recommend publication as is except for a few technical edits as listed below.

Technical comments:

P3 L11: . . . but it has not been FULLY examined because of. . .

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P8 L13 and elsewhere – please replace all instances of “transportation” with “transport”.

P8 L14 & 15: I suggest using “photochemistry” rather than “photolysis” here because the first reference on L14 is to both photolysis and phot-oxidation.

P8 L19: “faster” would be more unambiguous than “larger” in this context

Caption figure 2 – it would be helpful here to list the site names and three letter abbreviations so the reader is not obliged to go to the supplementary material to find out. Defined once is enough to cover all later figures.

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