

## Response to Authors on acp-2023-1435

### **Solar FTIR measurements of NO<sub>x</sub> vertical distributions: Part I) First observational evidence for a seasonal variation in the diurnal increasing rates of stratospheric NO<sub>2</sub> and NO**

I thank the Authors for reviewing their manuscript and for taking into account the comments and suggestions of both referees. The manuscript has improved and most of the referees doubts have been clarified. I think that this paper should be publish in AMT. However, I think that some questions remain unclear.

I apologize to the authors for my confusion with figure 6. I actually have a question about figure 4. I am very sorry, but I would appreciate it if you could answer it.

My question about Figure 4 is similar to that of Referee 2. Why do you observe this “shift” between both stations in the first part of the year (from January to June)? Not only the diurnal increase rates of March are different, taking into account the error bars, but also in May. Do you have some explanation?

After reviewing the latest version of the manuscript, I also have a new comment. Lines 261-262: From Figure 3, I do not see that the NO<sub>2</sub> concentration in summer is ~3.5 times the winter concentration. If the NO<sub>2</sub> average concentration in winter around noon (for instance), is 1.5E15 cm<sup>-2</sup>, the concentration for summer months around noon is around 3-3.5 E15 cm<sup>-2</sup>. That means that the concentration in summer is about **2 times** (twice) the concentration during winter.