

## Interactive comment on “Lightning-produced NO<sub>x</sub> during the Northern Australian monsoon; results from the ACIVE campaign”. Response to referee #1

We are very grateful for the referee’s useful comments.

*One major comment: in the abstract it is said that the high out-cloud values as measured in the monsoon period contrast with the pre-monsoon period, where the high NO<sub>x</sub> values occur mainly in the vicinity of storms. However, in the main text I cannot find the basis for this conclusion. So either the main text should be extended on this point (or did I miss it?), or this point should be omitted in the abstract.*

The referee is right; much higher NO<sub>x</sub> mixing ratios were measured during the pre-monsoon regime flights sampling Hector storms (peak values of the order of 4000 ppt), the average out-of-cloud values a full one order of magnitude lower than those peak values. In contrast, during the monsoon flight, while the in-cloud peak NO<sub>x</sub> mixing were significantly lower (maximum of 2000 ppt), the difference between average in-cloud and out-of-cloud mixing ratios was of the order of 27%, indicating a much more mixed troposphere, consistent with the more organized and widespread convection present during the monsoon regime along with the results of a closed circulation pattern as evidenced by the back-trajectories. A figure showing the average vertical NO<sub>x</sub> profiles of the two pre-monsoon NO<sub>x</sub> flights and the vertical profile of the flight discussed in the manuscript, along with a discussion, has been added to the “Discussion” section.

*-Minor point: abstract, line 6: ‘723 and 984’ should be ‘984 and 723’*

Done