Response to interactive editor comment by S. Buehler, doi:10.5194/acp-2015-974-EC1, 2016

We thank the editor for his comments on Figure 3. Please find below a clarification and more detailed explanation of the concept behind this figure. We will improve the explanation in the revised paper accordingly.

Comment: *I find the monthly mean anomaly figure (Figure 3) and its discussion in the text confusing. Is not the anomaly calculated relative to the monthly mean? Then the mean anomaly should be zero by definition. Please explain the concept behind this figure more carefully.*

Response: We agree that the explanation of this Figure was not yet very good. In order to explain the concept behind the figure more carefully in the revised paper we will therefore update both the Figure 3 caption and title, and the related text in Section 5.

The caption will be improved to a more clear explanation like this: "Figure 3. Multiyear-averaged monthly mean temperature (top) and bending angle (bottom) anomaly profile, averaged over May 2007–2013 (heavy green) and June 2007–2013 without the month of eruption June 2011 (heavy blue), in the area of Puyehue (left) and Nabro (right). For indicating an estimated uncertainty range from interannual climate variability, also the standard deviation of the individual monthly mean anomaly profiles about the multiyear-average is depicted in all panels, as an envelope about the multiyear average profile, for both May (light green) and June (light blue)."

Along with this, the title over the panels will be improved to "Puyehue May 2007-2013 and June 2007-2013 w/o 2011" (over the left panels), and to "Nabro May 2007-2013 and June 2007-2013 w/o 2011" (over the right panels), respectively.

The related text in Section 5 will be improved like this: "The question that arises is whether these thermal structures are really different and distinguishable from normal atmospheric conditions. Inspecting for reference normal climatological background variability for May and June months without volcanic eruptions, Figure 3 provides an overview on the atmospheric anomaly structure under such climatological conditions. It shows the monthly mean temperature and bending angle anomalies averaged over May 2007–2013 and June 2007–2013 (excluding the month of eruption June 2011), and their estimated interannual variability during these years, for the areas of Puyehue and Nabro. In the Puyehue region, monthly mean temperature anomalies in the UTLS stay within about ± 1.5 K in both months. In the Nabro region, the monthly mean temperature anomaly above the tropical tropopause reaches colder values in May (about –2 K ± 1.5 K) than in June (about 1 K ± 1.5 K), due to higher convective activity."

These improved explanations should now make Figure 3 and its interpretation clear to the readers. Note that the construction of the temperature and bending angle anomaly profiles themselves (against a reference RO climatology 2001–2012) is explained in Section 4 before.

Comment: *And a technical comment on the same figure: The top row misses x-axis labels.*

Response: We will add the x-axis annotation to the top panels of Figure 3 again ("Temperature anomaly [K]"); they inadvertently disappeared in the final production of the discussion paper.