

This manuscript provides an overview of the BLUESKY mission during the 2020 COVID-19 lockdown in Europe. The authors present interesting measurement results of SO<sub>2</sub> and SO<sub>4</sub><sup>2-</sup>, along with other trace gases and aerosols, at UTLS, which have the potential to be an important reference to future chemistry and modeling development. The authors have revised the manuscript with more discussions based on the comments from previous reviewers.

In addition to the comments from previous reviewers, I'm particularly interested in how wildfires contribute to SO<sub>2</sub>/SO<sub>4</sub><sup>2-</sup> profile changes. Although the authors cited previous studies that demonstrated smaller amount of SO<sub>2</sub> released from wildfires compared to that from volcanic eruptions, this wouldn't necessarily represent the BLUESKY case since the meteorological conditions may be different between 2019 and 2020. Based on the 2020 EU JRC wildfire report ([https://ec.europa.eu/commission/presscorner/detail/en/ip\\_21\\_5627](https://ec.europa.eu/commission/presscorner/detail/en/ip_21_5627)), there were still significant wildfire events in Europe, especially in Germany, during May 2020. If those wildfires were intense enough, SO<sub>2</sub> and SO<sub>4</sub><sup>2-</sup> at UTLS could be influenced. The authors should provide sufficient evidence to convince readers how these "local" wildfires, in addition to long-range transport SO<sub>2</sub> from other continents, didn't contribute significantly to the SO<sub>2</sub> and SO<sub>4</sub><sup>2-</sup> profile changes during the BLUESKY mission. Additional discussion about wildfires can help improve the manuscript.

#### **Minor comments:**

Ln 22, 124, 125, 128, 353, 358, 359. Keep the number expression consistent. A thin space is suggested before and after the plus-minus sign.

Ln 55. "(46°N, 0.8 Tg SO<sub>2</sub>)" is suggested.

Ln 59. Typo: "important source of stratospheric aerosol are intense wildfires, ..." should be "is" instead of "are."

Fig. 1 The bottom axis at 0 longitude seems to have an additional character embedded.

Ln 64. You may want to spell out COVID at its first appearance in the text. Also, be consistent with using COVID-19 or COVID19 in the manuscript.

Ln 128. Lower case of N for "nitrous."

Ln 132. This sentence should be combined with the previous sentence.

Ln 137. A proper citation/reference to the GDAS dataset is mandatory.

Ln 159. May replace "will follow" with "is presented."

Fig.2 caption. "... Plotted are a) SO<sub>2</sub>, ..., and f) altitude across longitudes ##°W–##°E."

Fig. 3 caption. Superscripts for 25<sup>th</sup> and 75<sup>th</sup>, be consistent with how they are used in the main text.

Ln 205. "... 310 K and 340 K; above the chemical tropopause the sum increases up to ..."

Ln 395. Typo: "were" instead of "where."