General comments:

The authors present one of the longest series of measurements of the total column of ozone globally. They also discuss the conditions and the procedures which ensure the high quality of the measurements. The scientific value of the presented dataset is high, and the manuscript is within the scope of the journal.
What I mainly miss, is a section wherein the authors would quantify the uncertainties of the final dataset. Uncertainty budget is of exceptional importance for anyone who would use the data. Thus, I strongly recommend that the authors should quantify the overall uncertainty and add the corresponding section.
The new section is added " 2.3 Uncertainty of the Brewer adjusted Dobson TCO data" describing uncertainties in the data. (line. 260-285).

A few more changes are also necessary prior to the publication of the manuscript. Specific comments are provided below.
Specific comments:
Below, in response to the reviewer's comments, we present the text with the suggested correction. The numbering of the lines relates to the corrected manuscript.

In the data files, or at least in an accompanying description file, please specify whether time is UTC or something else.
" The results of all intraday measurements for the period 1963-2019 have been previously stored at the PANGAEA data base with additional information including: time of observation (UTC), cloudiness type, air mass, and description of the wavelength pair and observation type selected for each individual measurement (Rajewska-Więch et al., 2020)." (line 351-353)

L7: please define that #84 is the serial number of the instrument.
"The total column ozone (TCO_3) measurements by the Dobson spectrophotometer (serial No. 84) have been carried…. "(line 7)

L13: please add "which were" before "also performed"
"To adjust this data to the Brewer spectrophotometer observations, which were also performed at Belsk, a procedure is proposed to account for …." (line 13-14)

L20: Please explain that #1 and #2 are the serial numbers of the instruments
" there existed data records from 2 stations Oxford (DI serial No. 1) and Arosa (DI serial No. 2) archived in…" (line 21-22)

L22: "TCO" instead of "TOC" like in the rest of the document. At the same line, the authors probably mean that "the number of ozone observations increased sharply" instead of "The ozone observations were triggered".
"TCO_3 increased up to about 50. The number of ozone observations increased sharply in the early 1980s …" (line 23-24)

L33: Delete "the"
"for ozone monitoring" (line 4)

L36: which ground-based network?
"have been used operationally in the TCO_3 ground-based observation network" (l.37-38)

L42: Similar results to those reported by Redondas et al. (2014), have been also reported by Fragkos et al., (2015).
"Redondas et al., 2014; Fragkos et al., 2015)"

L47: In addition to Ball et al., the following study should be also cited: Steinbrecht, et al. (2017).
", has also been driven by the recent climate changes (e.g., Steinbrecht et al., 2017; Ball et al., 2018)." (line 47)

L50: Please add references for the Arctic ozone depletion in 2020. For example: Wohltmann et al. (2020); Manney et al. (2020); Inness et al. (2020).
"Moreover, a severe chemical loss appeared in the Arctic stratosphere in spring 2020 (e.g., Manney et al., 2020; Wohltmann et al., 2020)." (line 52)

L54: Delete "of the"
"started monitoring atmospheric ozone" (line 56)

L55: Delete "including"
" there are only two stations with longer time series, Arosa (since 1926, Staehelin et al., 1998) and Hradec Kralove (since 1961, Vaníček et al., 2012). (line 57-58)

L65: "designed" instead of "deigned"
" The Dobson spectrophotometer is a double monochromator designed to measure TCO_3 " (line 67)

Figure 2 and lines 90 – 95:
First of all, the authors should explain how equations (1) and (2) were derived. Were all data shown in Figure 2 used to derive these equations?
" To eliminate a drift of the DS-ZS differences, the following transfer function from the regression line fit to the relative differences between DS and ZS TCO_3 subsets for $\mu \subset [2.8, 4.0]$) is used:" (line 97-99)

Secondly, if the data shown in Figure 2 were used, then equation (2) has been calculated using a limited number of data points. Thus, I am not convinced that applying this relationship on future data would provide an accurate correction. Since data points for air mass above 4 are limited, and uncertainties in both the measurements of Dobson and MKII Brewer at such air masses are very large, I would recommend excluding data for air masses larger than 4 from the final, merged dataset.
" However, the linear correction is not valid if $\mu > 4.0$ (Fig.2a). Only 0.7% of all TCO_3 observations had such high μ values. The fixed correction of 1.015 is applied if $\mu > 4.0$ but $TCO_{3,\,ZS}$* values should be treated with caution." (line 104-106)

Line 129: Please define R/N
" The R/N table is used to convert the dial reading (the so-called R value) obtained by the Dobson observer into the logarithm of the ratio between the light intensities in a pair of the UV wavelengths with weak and strong absorption by ozone (the so-called N value). N values are used in theoretical formulas to calculate TCO_3 (e.g., Dobson, 1957). " (line 135-137)

Section 2.2: Adding a Table summarizing the campaigns (place, reference instrument, etc) would be useful.
Table 1 is added. (line 149)

L172: Add reference(s) for the Brewer reference instrument. For example: Fioletov et al (2005).

" Self-testing, PC-controlled instrument designed for continuous long-term observations in all weather conditions (e.g., Fioletov et al., 2005)." (line 178-179)
L180: "This … spectrophotometers". Please rephrase. The meaning of this sentence is not clear.
" The Dobson measurements provide instantaneous TCO_3 values, while the Brewer instrument gives the average of 5 observations, so this could be an additional source of differences between the spectrophotometers." (line 189-190)

Figure 7: Even after the correction for the effective temperature there seems to be a trend in the ratio between the measurements from the two instruments (i.e. differences are ~+1% in 2002 – 2004 and ~-1% in 2018 - 2020). The authors should add some relative discussion (are these differences within the uncertainty of the merged dataset?).
" The smoothed curved in Fig.7b provides that the Dobson TCO_3 values were ~1% lower (2002-2004) and ~1% higher (2018-2019) comparing with the Brewer values. Such discrepancies may be related to the Brewer ZS TCO_3 values, as they may be influenced by clouds (ZS Brewer algorithm is based on a statistical relationship with parallel DS observations), which in some years cause overestimation (or underestimation) in relation to the Dobson TCO_3 values." (line 223-227)

Section 2.3.3: Discussion about the effect of stray light can be also found in: Moeini et al. (2019)
" Moeini et al. (2019) discussed the differences between TCO_3 values measured almost simultaneously by the Dobson and Brewer spectrophotometers due to the stray light effect. They found that the difference for low solar elevations (slant TCO_3 > 800 DU) was related to the level of stray light withing the instruments, which is especially high for the single monochromator Brewer (Brewer Mark II), i.e., the same type as the Belsk's Brewer " (line 241-244)

In this latter paper the authors show that at very large ozone slant paths (i.e., for very large air masses) the role of stray light becomes exceptionally significant. That makes the measurements of both instruments unreliable. As I did earlier, I recommend again removing measurements for air masses larger than 4 from the analysis, as the uncertainties are already very large, solely due to the effect of stray light.
" The present analysis show that the Brewer adjusted Dobson TCO_3 values are reliable for μ <4 or slant TCO_3 up to 1400 DU (Fig.10). (line 353-354)

Ideally, the authors should correct the measurements of both instruments for the effect of stray light, which of course is not a trivial task. Instead, they have scaled the measurements of Dobson to the measurements of the Brewer at large air masses. Assuming that the scaling is perfect, stray light still affects the measurements of the Brewer, and subsequently the ozone series. In any case, the authors should discuss, and try to quantify, the uncertainties related to the stray light effect.
New Figure 10 is added illustrating the stray light effect.
" The correction for the stray light effects was applied to reduce the TCO_3 differences between the Dobson and Brewer instruments for low solar elevation. The correction is not calculated separately for each instrument. However, Figure 10 shows, that the Brewer Adjusted TCO_3 intraday values are only slightly sensitive to changes in slant TCO_3, i.e., within the max-min range between 0.99 and 1.01 derived from the smoothed profile of the ratio between TCO_3 values non affected (slant TCO_3 <800 DU) and affected by the stray light) (line 308-312)