

1 **Supplementary Information**  
2 **for**  
3 **Speeding up in the stratospheric O<sub>3</sub> recovery of the Southern Hemisphere contrasting with**  
4 **the O<sub>3</sub> decline of the Northern Hemisphere as seen by IASI over 2008-2017**  
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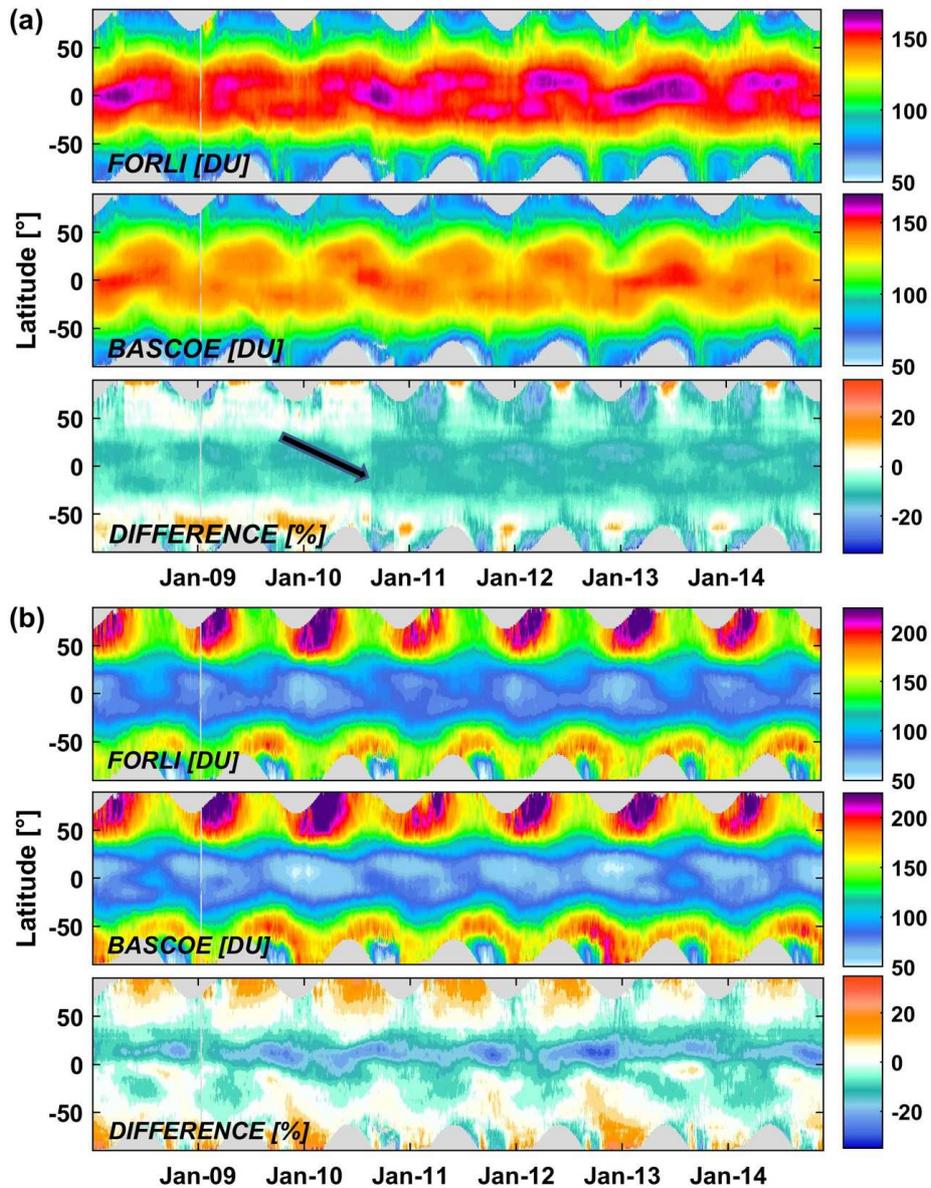
13 **Contents of this file**

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15 **1 Figure S1**  
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17 Figure S1 displays the latitudinal distribution of MUST O<sub>3</sub> columns as a function of time  
18 observed from IASI in comparison with that simulated by the BASCOE CTM with its standard  
19 chemical mechanism (smoothed by the IASI averaging kernels), as well as the IASI-BASCOE  
20 differences for the MUST and the LSt O<sub>3</sub> columns (Fig. S1 a et b, respectively). Note that the  
21 BASCOE simulations are driven by offline meteorological fields from ERA-Interim and  
22 performed after a 1 year spin-up with a horizontal resolution of 2.0°×2.5° and 60 levels in the  
23 vertical. Details on chemical mechanisms and parameterizations can be found in Huijnen et al.,  
24 (2016) and Chabrillat et al. (2018). The purpose of this comparison is not to perform a proper  
25 validation/comparison exercise but to highlight and to estimate the “Jump” amplitude that affects  
26 the IASI MUST O<sub>3</sub> time series and for which the exact reasons are still unknown. The “jump” in  
27 the IASI time series is clearly visible in the IASI-BASCOE difference panel on 15<sup>th</sup> September  
28 2010 in the MUST (see black narrow in Fig. S1a), while not in the LSt, as previously reported in  
29 the validation paper of Boynard et al. (2018). Based on that IASI-BASCOE comparison, the  
30 jump is estimated as reaching ~1-2 DU in the 55°S–55°N band and ~3-4 DU in the 55°–90°  
31 bands. These values are considered when analyzing trends in the MUST O<sub>3</sub> time series in  
32 Sections 4.1 to 4.3 of the paper.  
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40 **Figure caption**

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44 **Fig.S1:** Latitudinal distribution of (a) MUST and (b) LSt O<sub>3</sub> columns as a function of time  
 45 observed from IASI (in DU; top panels), simulated by BASCOE (in DU; middle panels) and of  
 46 the IASI-BASCOE differences (in %; bottom panels). The black narrow in the difference panel  
 47 for the MUST highlights a jump on 15<sup>th</sup> September 2010.

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