Answer to Referee #1

1. **In abstract, add “-2” after “Experiment”**
   done

2. **P7985, L2 and P7986, L16, Change “solar flux” to “solar radiance” since the spectral flux has unit of photons/cm^2/s/nm, while spectral radiance has unit of photons/cm2/s/nm.**
   done

3. **P7985, L10, Metop-B was launched on Sept. 17, 2012. Please rephrase this sentence.**
   done

4. **P7985, L18, change “a long term data-sets” to “long-term data sets”**
   done

5. **P7985, L21, it is not necessary that using FM cross section leads to smaller fitting residuals. For example, in Liu et al. (2007), using BMD cross sections gives the smallest fitting residuals. So suggesting changing “reduces” to “might reduce”**
   done

6. **Figure 1 caption, change “cross section” to “cross sectionS” or “cross section spectra”**
   done

7. **P7991, L2, change “must be also” to “must also be”**
   done

8. **P7993, L2, change “and and” to “and”**
   done

9. **P7993, L17, change “less good” to “worse”**
   done

10. **P7993, L23 and in Table 3, it says “Hartley band” but include “245-340 nm”, i.e., including both Hartley and Huggins bands**
    done

11. **P7995, L7-8, change “the lower cross section spectral resolution spectrum” to “the lower spectral resolution cross section spectrum”**
    done

12. **Figure 5 title, it says “FWHM=0.00”, should not it be the “GOME-2 FWHM”? Suggest adding “nm” for the shift in the title and adding unit in the y-axis**
    “FWHM=0.00” means that a slit function fit was not performed in the non-linear least square fit since BMD, Bass and Paur and Burrows were

already convolved with the wave length dependent GOME-2 slit function (mentioned in page 7995, line 3-5). “FWHM=0.00” will be removed from the tittle to avoid misunderstanding. We add a physical unit in the y-axis and „nm“ to the shift in the title.

13. Table 6 is not referred in the text.

done

14. P7995, L9, label this equation as equation (3) and the next one as equation (4)

done

15. P7995, last paragraph, according to the fitting equation and Table 6, scaling factor is around 1, but in the text, 1%, 2-3% (rather than 0.988, 1.026) is used, which is difficult to follow. It is better to be consistent.

done

16. P7996, L7, please explain in more detail about how to convolve GOME FM with GOME-2 slit function as GOME FM cross section is already at GOME spectral resolution (which is similar to GOME-2 spectral resolution)”. Do you de-convolve GOME -FM with GOME slit functions first and then convolve the de-convolved GOME FM with GOME-2 slit function?

The GOME FM data is first deconvolved and then the de-convolved GOME FM is convolved with the GOME-2 slit function (this will be clarified in the text).

17. Since the measured GOME-2 FM cross sections are relative cross sections, and need to be scaled by BMD and Bass and Paur data as discussed in section 2.4, why are there still some large differences of 2-3% between GOME-2 FM and BMD and Bass and Paur data according to section 4.3? Please clarify this.

The area under OD spectra at the various temperature were normalized to unit area to obtain the correct relative temperature dependence among them. The normalized OD spectra were then scaled at once (scaling was not done for each temperature spectrum) to the literature data at the various selected wavelengths. From the scaling factors derived for each wavelength a weighted mean was calculated to obtain a single scaling factor for all normalized OD spectra. This has been clarified in the main text. The 2-3% percent differences seen between GOME-2 FM and BMD/Bass paur is within the uncertainty of measured ozone cross-sections as indicated in the literature.

18. In Figs. 7 and 8, please clearly define the relative difference (which minus which one). Any idea about why the difference is higher at higher latitudes? Between Fig. 7 and Fig. 8, in Fig. 7, most of the differences are positive, but in Fig. 8, a lot of the differences between 50S-50N are negative. What causes the differences between Fig. 7 and Fig. 8?

Relative difference is defined as (TOZ(GOME-2 FM3) - TOZ(GOME FM))/TOZ(GOME FM) X 100%. TOZ: total ozone column (this will be stated

in the text). The higher difference in the high latitudes is probably due to differences in the temperature dependance between GOME FM and GOME-2 FM3 data (it should be noted here that it is not known which data has the right temperature dependence). This will be clarified in the paper. There was a mistake (wrong shift value) in the retrieved ozone used in Fig. 8, the new plot displays the same differences at low latitudes.