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Atmospheric Measurement Techniques Discussions

Interactive comment on "Version 2 Ozone Monitoring Instrument SO_2 Product (OMSO2 V2): New Anthropogenic SO_2 Vertical Column Density Dataset" *by* Can Li et al.

Anonymous Referee #3

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1. For the abstract. Authors mentioned several versions of OMSO2. If there is a table in the content listing each versions' characterization that would be helpful? 2. Line 32. It might be better for readers to have a reference about how anthropogenic so2 emission "have significant impacts on the environment". 3. Line 73. Is it accurate to say the AMFs represent the sensitivity of radiances to SO2 VCD? Jacobians yes. But for AMF, is that just a factor between SCD and VCD? Although it can be affected by a lot of factors. 4. Line 83∼84. Can I understand the new update in the version 2 is the improved anthropogenic SO2 product? 5. Line 117, "SO2 light absorption". Is this a precise expression? I guess you want to say the light (radiance) being absorbed by SO2. 6. Line 123, do you want to say SZA>75 degree? 7. Line 173,

what does sun-normalized radiances (I) mean? Is that the ratio of the back scattered radiance and the solar irradiance? But in line 181, the "I" has been defined as "Backscattered TOA radiance). 8. Line 242, Are you saying "within the SAA region of 0-45°, 100°W-5°E"? 9. Line 404 to 411. In this paragraph, are you comparing version 2 with snow/ice and without snow/ice? If yes, how do we evaluate the retrievals for the two case? By comparing the third party, you tell us, that SO2 retrieval over snow/ice covered surface might be more accurate than not be covered. How about the case of Norilsk in April and in July (starting from Line 394)? In that case, are you expressing that older version with constant Jacobian caused more seasonal change (snow cover and snow free)? 10. Line 416, when you say the OMI rows, do you mean the cross track number? 11. Why do you summing up the so2 mass for grid cells' VCD > 0.1? By what reason you selected two thresholds 0.5 and 0.1DU?

Please also note the supplement to this comment:
https://amt.copernicus.org/preprints/amt-2020-186/amt-2020-186-RC1-supplement.pdf

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