

Interactive comment on “Anthropogenic and volcanic point source SO₂ emissions derived from TROPOMI onboard Sentinel 5 Precursor: first results” by Vitali Fioletov et al.

Anonymous Referee #1

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The authors present in this paper first result for the estimation of SO₂ emissions from point sources using TROPOMI data. They apply a well-documented methodology already applied in previous publications on other satellite data (e.g. OMI, OMPS). They demonstrate in this publication the impact of TROPOMI's high spatial resolution on the potential of the algorithm to estimate emissions from weaker sources as well as to finer separation of point sources. Issues relative to large scale biases are discussed and the results are compared with the ones estimated from OMI and OMPS data. The paper is well written and structured and should be accepted for final publication after considering my comments below.

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Page 5, Line 11: The -3DU threshold is related to the spread of the distribution of the SO₂ values? Please comment.

Page 5, lines 12-14: Probably the comma is misplaced, but generally this sentence needs rephrasing. It is not clear how this limit is set. Please elaborate here more. As it is now these limits seem arbitrary.

Page 6, Line1-9: The whole discussion on the AMF and the temperature dependence is confusing. Do the authors use a specially processed TROPOMI product for this paper (without temperature adjustment, but increased by 22%) and the official product is still the one where an AMF correction factor for the temperature dependence is applied?

Page 6, line 24-27. Is there any possible explanation for this seasonality in standard deviation?

Page 7, line 5-10. Can the authors provide an explanation, why the standard deviations from TROPOMI are larger? Is it instrumental or a matter of spatial resolution differences?

Page 10, lines 9-16: Is there any justification for the size of the rectangular where the fit is applied and its dependency on the source strength?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-1095>, 2020.

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