Comments for "The 2011 Nabro eruption, a SO2 plume height analysis using IASI measurements" by L. Clarisse et al.

General comments: This is solid scientific contribution that sheds additional light on the transport of volcanic emissions during the NABRO eruption into the lower stratosphere. It contributes new insights that both compliment earlier papers on this eruption and enhance our understanding of troposphere-to-stratosphere transport in the tropics. In order to remove some existing ambiguities in this paper, I ask that the authors address the specific comments that follow.

Specific comments

Page 31163, lines 11-16: This sentence is too long and awkward – particularly the use of 'markedly'

Page 31163, lines 27-28: Imprecise, recommended change: 'offsetting global warming' to 'offsetting the radiative forcing of greenhouse gases'.

Page 31167, lines 15-17: 'better than any forward model could ever do'? This is a very strong statement. Can you prove this? Do you actually think that you can anticipate any forward model that could ever be conceived?

Pages 31167-8: The use of 'apparent column' and 'true column' is somewhat confusing and imprecise. By 'column', I understand you to mean 'a vertical profile of constituent concentrations'. So, is the 'true column' the actual concentrations and 'apparent column' an estimate of the actual concentrations? Regardless of the accuracy of my interpretation, some clarification is warranted.

Pages 31167-8: The distinction between 'apparent column' and 'true column' seems disingenuous (unless the interpretation in the previous comment is totally wrong). Any measurement is an estimate of the actual value and the estimates of 'poor' measurements only differ from 'good' estimates in magnitude of the error – not in the existence of error. Please reformulate the discussion so that you explain why your method reduces error – not as a claim that your retrieve values are 'true'.

Pages 31169, line 25: Change 'extend' to 'extent'

Pages 31170, line 17: Provide context for altitudes; e.g., 'Displayed altitudes reach … '

Pages 31170, line 18: Change 'Central in' to 'Central to'

Pages 31170, line 22: Change 'either' to 'any'

Pages 31171, line 25: Change 'below 20°' to 'south of 20°'

Pages 31172, lines 4-5: Change 'conclusion from such data only' to '*conclusions* from such data *alone*'

Pages 31172, line 14: Please use a more meaningful phrase than 'reveals an excellent match' – for example – 'reveals that the trajectories capture important features of SO_2 transport'.

Pages 31176, line 11: Choose a more meaningful descriptor than 'excellent match'

Pages 31176, lines 12-13: The phrase 'with agreement almost systematically below 2 km' is awkward and confusing. Do you intend to say something like 'altitude discrepancies are, for the most part, less than 2 km'?

Pages 31176, line 24: Again – 'excellent'? This is a solid scientific paper – why ruin it?

Pages 31177, line 3: Excellent! (just joking) Please change it.

Pages 31177, line 5: The standard deviation of the differences can't possibly be -0.1. The standard deviation can never be negative. I think you might mean that the bias is -0.1. From your plot I would guess that the standard deviation is closer to 1 km (maybe it's 1.3?). Also, a correlation of 0.68 is hardly 'excellent' when comparing two fields that should be identical. This corresponds to only 46% explained variance.

Pages 31177, line 10: Change the phrase 'The agreement between the two instruments is very good' to something like 'The agreement between the two instruments is not as good as it is during the early days of the plume'.