**Review of "Multimodel emission metrics for regional emissions of short lived climate forcers" by B. Aamaas**

**General comments**

This is a fascinating and well-written paper, and should be accepted with minor revisions. It tackles an (almost) endlessly complex topic, and although it is quite tough going in places, I think it is (almost) as clear as it could be. From my specific comments below, I would like a little more discussion of a few points. I realise this will only lengthen an already quite long paper, so I recommend these requests are dealt with as concisely as possible.

**Specific comments**

Title: maybe it's OK, but I'd prefer not to see 'emission/s' twice. 'Metrics for regional emissions of short lived climate forcers from multiple models'?

P26090 l6 Delete 'season'

P26090 l16 (and throughout) I appreciate 'ramp up' is the commonly used phrase, but in most cases when we are thinking about emissions mitigation, it is a reduction, or 'ramp down' of emissions that is being considered. How about dispense with 'up', and just say 'ramp', or 'ramping'?

P26090 l26 '…when accounting for correlations' – clarify

P26091 l7 Define BC, OC, VOC at first use. I know these are near universal acronyms now, but let's do this properly. Maybe this should be in the abstract.

P26091 l9-10 Reword sentence beginning CH4. Explicitly state the CH4 lifetime is ~10 yr.

P26092 l2 …emit a range of species…

P26092 l16 However, for SLCFs,…

P26092 l22 …distinct patterns…?

P26093 l4 …the impact also depends upon the season of emissions.

P26093 l19 ramp up (see earlier) – ramped here?

P26094 l5 Delete 'for'

P26095 l1 Clarify you mean aerosol species, not the precursor – i.e. the important lifetime is that of the aerosol (e.g. $(NH_4)_2SO_4$), not its precursors, $NH_3$ and $SO_2$.

P26095 l2 You perhaps need to define 'adjustment time', clarifying the difference between a lifetime and an adjustment time (e.g., with the example of $CH_4$).

P26095 l5 It is probably best for clarity to be consistent, and define $IRF_T$ as 'impulse response function for temperature', in line with later uses of IRF.

P26095 l11-15 I am not completely familiar with the concept of $IRF_T$. From what is written I first get the impression that it is independent of species, but then I am left unsure. If it is dependent on the species, should it have a subscript i?

P26100 l13 Clarify – is it $(NH_4)_2SO_4$ aerosols that are higher in summer?

P26100 l23 Comparison of the VOC and CO GTP(20) values maybe merits discussion – I certainly find Figure 2 fascinating. Clearly, VOC oxidation generates CO, so the VOC values should bear some resemblance to the CO. One difference is that the VOC generates more O3, so the O3 component is more important. This O3 itself generates more OH, but clearly the overall impact on OH of VOC is more negative than for CO, as the methane components are about 4x larger. This factor must depend quite strongly on the emitted mix of VOCs. Is there a dominant VOC, or is the signal coming from a whole range of different VOCs, with different lifetimes and O3 production potentials? Is the VOC mix and chemistry different between the models?

P26100 l29 Ships emit into the lowest background NOx environments – I guess this is why they have larger impacts?

P26103 l8-9 So why do European $SO_2$ emissions have higher value metrics compared to East Asian? Is it purely due to geography, or is it because background levels are higher in Asia, and the impact of emissions tends to saturate?

P26103 l16 And why are CO emissions the opposite (E Asia > Europe)? Is it just because they are emitted nearer the equator, where they have greatest impact on OH and CH4 lifetime?

P26107 l25 Why is the aerosol effect from NOx not cooling for ships? Do they somehow shorten the SO4 lifetime?