

Interactive comment on “Composition of gaseous organic carbon during ECOCEM in Beirut, Lebanon: new observational constraints for VOC anthropogenic emission evaluation in the Middle East” by Thérèse Salameh et al.

Anonymous Referee #2

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This paper describes NMVOCs measurements conducted in summer and winter time in Beirut and the assessment of emission ratios using two different methods. Emission ratios derived from measurements conducted at a suburban site were compared with those performed near a road transport sector. This comparison suggested that for the majority of NMVOCs, road transport is the main source of emission in Beirut. Therefore, ERs derived from the observations at a suburban site were also compared with those extracted from emission inventories for all the anthropogenic sectors. The authors concluded that the overall speciation of anthropogenic sources is reasonably represented. Additionally, ERs derived from near-road measurements were compared

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with those from emission inventories only from the road transport, concluding that there is a consistency of ER from road transport within a factor of 2 with EMEP but a high underestimation was found for xylenes and toluene by ACCMIP.

General comments: This paper presents a rich data-set for a region where emission data and measurements are still scarce. The paper is well written and structured and the methodology adapted for deriving ERs and comparing them to emission inventories is rigorous. I recommend the manuscript for publication with minor corrections.

Some minor comments:

I would recommend to shorten the abstract

L170 Rephrase “Only the anthropogenic part of the emissions regarding road transport (SNAP 07) “. As formulated it seems that there is a biogenic part of the road transport

L283: Did you use the same value of OH concentration for both seasons? (5.106 299 molecules.cm⁻³). Could you briefly discuss the impact on the results if this value is different between summer and wintertime?

L222: Please define kOH the first time it appears in the text. Specify that it's a reaction rate coefficient

L225-226: This sentence is not very clear and should be reformulated. What is this threshold value of $8.52 \times 10^{-12} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$?

L270-273: It is hard to believe that there is “ no photochemistry during daytime in summer” especially in the Middle east region

L299: Please indicate that the value in the parenthesis is the assumed concentration of OH.

L306 Replace “keeps” with “remains” or “is”

L337: the sentence should be completed in order to specify that wintertime ER agree

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at +/- 30% . . . with the summertime ERs

Figure 4: Please use different markers for the different compounds

Figure 5. It should be added in the legend that the figure represents only ethane data.

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