

Interactive comment on “Vehicle emissions of greenhouse gases and related tracers from a tunnel study: CO : CO₂, N₂O : CO₂, CH₄ : CO₂, O₂ : CO₂ ratios, and the stable isotopes ¹³C and ¹⁸O in CO₂ and CO” by M. E. Popa et al.

Anonymous Referee #1

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Review of the manuscript by Popa et al.

entitled:

Vehicle emissions of greenhouse gases and related tracers from a tunnel study. . .

Overall quality

The paper presents an application of atmospheric measurements performed in the road tunnel to characterise traffic emissions of CO₂, CO, CH₄, N₂O as well as isotopic

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signature of CO₂ and CO typical for West-European vehicle fleet and representative for typical regional not disturbed traffic. An independent methods of characterisation of traffic emissions with respect to greenhouse gases is very important because of uncertainty of bottom-up estimates based on traffic statistics and emission factors obtained in most cases in the laboratory conditions and not reflecting real situations. On the other hand UNFCC partners are obliged to report GHG emissions (eg. CH₄, N₂O) from the traffic. The paper is well structured and includes an interesting and novel data set, description of the sampling site and methodology is clear and well referenced. The authors put special attention on the measurement procedures applied in the study including inter-laboratory comparisons providing high quality of the data. Overall, the interpretation of the results is very sound and the authors include an extensive explanation for the possible mechanisms influencing obtained isotopic results. Besides the few minor issues, the paper is generally of high quality, interesting and fulfills the criteria of publication in ACP.

General comments:

1. In the introduction authors discuss the influence of Euro 3 and Euro 4 standards on the reduction of CO from cars. While Euro 5 standard is effective since 2009 it would be good to reference and discuss emission limits defined by this regulation.

Technical comments:

Page 23557 line 15: please change “. . . second most important greenhouse gas. . .” to “. . . second most important anthropogenic greenhouse gas. . .”

Resuming, I recommend to publish the paper after minor improvements.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 23549, 2013.

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