

Interactive comment on “Carbon isotopic signature of coal-derived methane emissions to atmosphere: from coalification to alteration” by G. Zazzeri et al.

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Received and published: 5 April 2016

I think this paper must stress the fact that global modeling studies have been using a $\delta^{13}\text{C}_{\text{CH}_4}$ signal from coal emission of -35% based on Deines 1980. However, after reading this paper, I have realized that this is a rather unrealistic value because it is only representative of anthracite mines, which are probably less abundant and more restricted to certain regions (e.g. Western Europe, Eastern China, Appalachians) than lower rank coals. I think global modelers would benefit if the information in table 2 would be accompanied by a map with the median coal mining $\delta^{13}\text{C}_{\text{CH}_4}$ signal from each country or basin. Moreover, as a kind of uncertainty analysis, the $\delta^{13}\text{C}_{\text{CH}_4}$ signal obtained could be compared to the signal calculated using alternative methods,

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e.g. a Miller-Tans plot [Miller and Tans, 2003]. Although this might exceed the scope of this work, the author might want to consider providing a weighted mean coal mining $\delta^{13}\text{CH}_4$ signal (based on the source strengths per country from EDGARv4.2 or Schwietzke et al. [2014]) because most global atmospheric $\delta^{13}\text{CH}_4$ studies are done with box models.

Additionally, the information on the air sampling strategy should be extended, e.g. how many flask samples, how often were they taken, how was it chosen when to sample, are there background samples? Additionally, more information on the $\delta^{13}\text{CH}_4$ analysis should be given, e.g. reference standard (e.g. VPDB, NBS-19 material or other), calibration gas, precision of measurements).

I would also like to point out that there is a large map containing the location of UK mines but not of Australia and Poland. Adding a layer of coal seams to the map would also be helpful, if this is available.

Finally some references in the text are wrong: Mikaloff-Fletcher et al. 2014 should be 2004 Smith and Rigby 1981 should be Smith et al. 1981

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-235, 2016.

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