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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Constraining sector-specific CO_2 and CH_4 emissions in the United States" *by* Scot M. Miller and Anna M. Michalak

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Thank you for the ideas and suggestions for the review paper. They have greatly helped us improve the manuscript. Below, we have listed each of the suggestions and the corresponding revisions that we have made to the manuscript.

- In the introduction there should be some mentioning of INDCs (Intended Nationally Determined Contributions), which were decided during COP 21 in Paris 2015.

  This is a great suggestion. We have included INDCs in the revised introduction.

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- P3 L1-2: I suggest reformulating to “frameworks that can synergistically leverage the information content of bottom-up datasets and top-down strategies using atmospheric GHG data”

  We have updated this sentence accordingly.

- P3 L7: May be reformulate “to attribute that trend to a specific source sector(s)” to e.g. “to attribute this trend to trends in specific source sectors”

  We have revised the sentence accordingly. The new wording sounds more precise.

- P4 L27: A reference for EDGAR needs to be included here.

  We have added a reference to EDGAR in this line.

- P15 L22: I think a reference to Dils et al., 2014, which systematically validates CH4 and CO2 products from GOSAT against TCCON data, would be appropriate: Dils, B., Buchwitz, M., Reuter, M., Schneising, O., Boesch, H., Parker, R., Guerlet, S., Aben, I., Blumenstock, T., Burrows, J. P., Butz, A., Deutscher, N. M., Frankenberg, C., Hase, F., Hasekamp, O. P., Heymann, J., De Mazière, M., Notholt, J., Sussmann, R., Warneke, T., Griffith, D., Sherlock, V. and Wunch, D.: The Greenhouse Gas Climate Change Initiative (GHG-CCI): comparative validation of GHG-CCI SCIAMACHY/ENVISAT and TANSO-FTS/GOSAT CO2 and CH4 retrieval algorithm products with measurements from the TCCON, Atmos. Meas. Tech., 7(6), 1723–1744, doi:10.5194/amt-7-1723- 2014, 2014.

  This is a great suggestion. We have added this reference to the corresponding line of the revised manuscript.

- P15 L28: Here I think the CarbonSat mission should be mentioned, as it combines high spatial resolution with a large swath, making it useful for emission detection. Some rel- evant papers are listed here: Buchwitz, M., Reuter, M.,

Bovensmann, H., Pillai, D., Hey- mann, J., Schneising, O., Rozanov, V., Krings, T., Burrows, J. P., Boesch, H., Gerbig, C., Meijer, Y. and Löscher, A.: Carbon Monitoring Satellite (CarbonSat): assessment of atmospheric CO2 and CH4 retrieval errors by error parameterization, Atmos. Meas. Tech., 6(12), 3477–3500, doi:10.5194/amt-6-3477-2013, 2013. Pillai, D., Buchwitz, M., Gerbig, C. and Koch, T.: Tracking city CO2 emissions from space using a high reso- lution inverse modeling approach: A case study for Berlin, Germany, Atmos. Chem. Phys., doi:10.5194/acp-16-9591-2016, 2016.

CarbonSat was a notable shortfall in the initial manuscript. We have added several lines on CarbonSat and GeoCARB to this section (along with the references above). Thank you for including these suggested references; they are very helpful.

- P17 L17: reword “now markets and ethane analyzer” -> “now markets an ethane analyzer”

  Thank you for pointing out this typo. We have fixed it in the revised manuscript.

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