

Interactive comment on “Constraining sector-specific CO₂ and CH₄ emissions in the United States” by Scot M. Miller and Anna M. Michalak

Anonymous Referee #1

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This paper reviews methods and datasets for estimating or constraining sector specific emissions of CO₂ and CH₄ in the US. The review paper refers to quite recent publications. The paper is well written, and I recommend publishing after the following minor comments are addressed.

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

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”

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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”

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

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.

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 relevant papers are listed here: Buchwitz, M., Reuter, M., Bovensmann, H., Pillai, D., Heymann, 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 resolution inverse modeling approach: A case study for Berlin, Germany, *Atmos. Chem. Phys.*, doi:10.5194/acp-16-9591-2016, 2016.

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

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-643, 2016.

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