Dear Editor,

Following Reviewer#2's suggestion, we performed additional calculations. We have added an extra paragraph to the end of Section 3.2 about the results of these calculations. The results do not change the previously reported data and the conclusion of the paper, therefore we have not made any more significant changes in the text of the manuscript. An extra table (Table S1) has been added to the Supplement containing the results of the additional calculations.

Yours sincerely

László Haszpra

Response to Reviewer#2

We thank the Reviewer for his/her suggestion. Following the suggestion, we recalculated the emission density of the village taking into account the likely diurnal and temperature variations in the natural emissions (F_{nature}). A simple bivariate regression model could not be applied because of the high non-Gaussian scatter of the low number of data and the cross-correlation between time and temperature. Instead, we grouped the natural fluxes into 3-hour time windows (0–3 h, 3–6 h, 6–9 h,... local standard time), and within each time window the data were grouped into 3-degree temperature ranges centrally to 0 °C (-10.5 – -7.5 °C, -7.5 – -4.5 °C,-4.5 – -1.5 °C, -1.5 – +1.5 °C,...). The median flux was calculated for each group including at least 10 data. These median fluxes presented in the new Table S1 in the Supplement were used as $F_{natural}$ for the recalculation of $F_{village}$ taking into account the actual temperature and time of the day. For the 3 cases for which the median was not available, the median of the nearest temperature range was used. The calculated emission densities for CO, N_2O, and CO_2 from the village at $\alpha \geq 0.3$ are 3.6 μg m^{-2} s^{-1}, 36.3 ng m^{-2} s^{-1}, and 73 μg m^{-2} s^{-1}, respectively, practically the same as using the constant $F_{village}$ (median of the overall dataset). The N_2O emission is lower by approximately 15 % according to this method but it does not question the conclusion, namely, the official N_2O emission is significantly underestimated. We have added an extra paragraph to the end of Section 3.2 (lines 382-392 in the revised manuscript) about the method and the results of the above calculations and left the other part of the manuscript unchanged.

Minor comments:

Lines 215-216: Please add in parenthesis that to derive α, the integral concerns all grid cells appearing in Fig. 3.

An extra sentence has been added in lines 216-217 of the revised manuscript.

Figure 5 Caption: Shouldn't the 4277 be 1120?

x=0 (α_{min}=0) means $\alpha \geq 0$, that is all available data (background [α=0, 1120 data] and village of any footprint coverage [α>0]), the total number of which is 4277. See line 207.