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## Methane flux and its relationship with carbon dioxide emission in urban residential areas in Seoul, Korea.

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Methane (CH<sub>4</sub>) is the second most important greenhouse gas. However, the measurement of urban CH<sub>4</sub> flux is exceptionally scarce. Here we present the observational results based on the eddy-covariance method at the high-rise and high-population residential area in Seoul, Korea. The magnitude and temporal variation of CH<sub>4</sub> flux show a significant strong relationship with carbon dioxide emission rate. The observed emission rate of CH<sub>4</sub> over the residential area is 21.8 nmol m<sup>-2</sup> s<sup>-1</sup> on average, and this is corresponding to 11 gC m<sup>-2</sup> yr<sup>-1</sup> which is comparable with boreal, taiga, and temperate wetlands. The carbon-isotope compositions ( $\delta^{13}\text{C}$ ) of CH<sub>4</sub> (about -46‰) and CO<sub>2</sub> (about -28‰) point to the same source for both gases suggesting vehicular traffic as a dominant source for CH<sub>4</sub> in this study.

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