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Methane and nitrous oxide emissions in The Netherlands: ambient measurements support the national inventories

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Abstract. We present net emission estimates of CH₄ and N₂O of The Netherlands based on measurements conducted during the period of May 2006 to April 2009 at station Lutjewad, The Netherlands (6°21' E, 53°24' N, 1 m a.s.l.). ²²²Radon mixing ratios were applied as an indicator for vertical mixing and long-range air mass transport and used to calculate the net surface fluxes from atmospheric mixing ratios of CH₄ and N₂O. Our study shows that our measurement site Lutjewad is well-suited to measure emissions from The Netherlands and validation of the national inventories using the ²²²Radon flux method. Since this study is purely observation-based it is independent from inventories or atmospheric models. Our results are compared to the national inventories as reported to the UNFCCC. We found net emissions of: (15.2±5.3) t km⁻² a⁻¹ for CH₄ and (0.9±0.3) t km⁻² a⁻¹ for N₂O. These values are lower than the inventory-based emissions (2006-2008 averages) of (18.3±3.3) t km⁻² a⁻¹ for CH₄, and (1.3±0.6) t km⁻² a⁻¹ for N₂O, but the differences are insignificant.

[Final Revised Paper](#) (PDF, 5225 KB) [Discussion Paper](#) (ACPD)

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