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### Assessment of methane emissions from a dairy housing using an inverse dispersion technique

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Quantification of gaseous emissions from diffuse sources, e.g. animal farms, is challenging due to their heterogeneity in space and time. The inverse dispersion technique is a promising option, which is increasingly used to determine gaseous emissions from diffuse sources, as it offers high flexibility at reasonable costs. So far, the inverse dispersion technique was only applied under Monin-Obukhov similarity theory conditions, which are often not fulfilled in central Europe. Here we use a simple backward Lagrangian stochastic (bLS) model in combination with open-path tunable diode laser spectrometers up- and downwind of the source in non-homogeneous horizontal and flat terrain and difficult micrometeorological conditions to model methane emissions from a dairy housing and compare it to simultaneously conducted in-house tracer measurements. We could show that the bLS model works also under non-ideal model conditions and that the method can be used to model emissions of sources in areas for which an emission estimate was not possible so far.