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Sommario/riassunto	Recent development of accurate instruments for measuring greenhouse gas concentrations and the ability to mount them in ground-based vehicles has provided an opportunity to make temporally and spatially resolved measurements in the vicinity of suspected source locations, and for subsequently estimating the source location and strength.^The basic approach of using downwind atmospheric measurements in an inversion methodology to predict the source strength and location is an ill-posed problem and results in large uncertainty.^In this report, we present a new measurement methodology for reducing the uncertainty in predicting source strength from downwind measurements associated

with inverse modeling.^In order to demonstrate the approach, an inversion methodology built around a plume dispersion model is developed.^Synthetic data derived from an assumed source distribution is used to compare and contrast the predicted source strength and location.^The effect of introducing various levels of noise in the synthetic data or uncertainty in meteorological variables on the inversion methodology is studied.^Results indicate that the use of noisy measurement data had a small effect on the total predicted source strength, but gave rise to several spurious sources (in many cases 8-10 sources were detected, while the assumed source distribution only consisted of 2 sources).^Use of noisy measurement data for inversion also introduced large uncertainty in the location of the predicted sources.^A mathematical model for estimating an upper bound on the uncertainty, and a bootstrap statistical approach for determining the variability in the predicted source distribution is demonstrated.^The new measurement methodology, which involves using measurement data from two or more wind directions, combined together as part of a single inversion process is presented.^Results of the bootstrap process indicated that the uncertainty in locating sources reduced significantly when measurements are made using the new proposed measurement approach.^The proposed measurement system can be significant in determining emission inventories in urban domains at a high level of reliability, and for studying the role of remediation measures.