



Region of influence of 60 European measurement sites based on modeled mixing ratios

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The regions of influence (ROIs) of 60 European measurement sites are quantified based on modeled mixing ratios. The mixing ratios are obtained by combining regional scale, time-reversed Lagrangian particle dispersion modeling for Europe with gridded CO inventory data from EMEP. As the lifetime of CO is on the order of weeks to months, thus much longer than typical transport timescales within Europe, CO emissions within Europe may be considered as passive tracers of infinite lifetime. The set of ROIs obtained in this way we complement by different sets of ROIs obtained by slight variation of the above conditions. First, to explore the effect of the tracer lifetime on the ROIs we generated sets of ROIs using different, artificial tracer lifetimes in the range of hours to days. Second, to explore the effect of the source distribution on the ROIs we generated sets of ROIs from modified gridded CO emission data, retaining only a few emission sources. The computed mixing ratios are available at three hourly time resolution. Most of the sites considered in this study are generally qualified as either rural background sites or high altitude sites. Particular emphasis is given to the analysis of the overall coverage of Europe by the 60 sites selected.