Separation distances at different sites calculated with the Austrian Odour Dispersion Model (AODM)

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The Austrian Odour Dispersion Model (AODM) is a Gaussian model adapted for the prediction of odour sensation. It estimates the daily and seasonal variation of the odour emission, the average ambient odour concentration and the momentary (peak) concentration for the time interval of a single human breath (approx. 5 seconds). Peak concentrations further downwind are modified by use of an exponential attenuation function for which the ratios of the standard deviations of the wind components to the average wind speed have either to be taken from the literature or to be calculated e. g. from ultrasonic anemometer data.

AODM calculates direction-dependent separation distances for a combination of odour threshold and exceedence probability which are a function of the prevailing wind velocity and atmospheric stability conditions. Meteorological time series from two sites in Styria in southern Austria and one site in the Austrian flatlands North of the Alps, all rural, are used for a sensitivity study of separation distances. In Austria, conventional discrete stability classes are either obtained by a combination of cloudiness and wind speed data or radiation balance and wind speed data (the third method, the combination of the vertical temperature gradient and the wind speed, is seldom used). Meteorological sites in Austrian South-Alpine valleys and basins are subject to valley wind systems, whereas sites in the North-Alpine foreland usually are not, apart from those in side-valleys to the Danube river. The sensitivity analysis will focus on two issues: first on how two different schemes to determine atmospheric stability and second on how the different meteorological conditions North and South of the main

Alpine chain influence the separation distances.