OUTPUT SPECIFICATION FOR MEAN CONCENTRATION AND DEPOSITION FLUXES

CERC

In this document 'ADMS' refers to ADMS 6.0, ADMS-Roads 5.0, ADMS-Urban 5.0 and ADMS-Airport 5.0. Where information refers to a subset of the listed models, the model name is given in full.

1. Introduction

The Output Specification describes the user-specified output points and the calculation grid used in short-term and long-term calculations. Output points may be specified in Cartesian coordinates defined with respect to fixed north-east coordinate axes.

2. Output Points

2.1 Gridded

The user may define a grid which has regularly or variably spaced values of X, Y and Z for a Cartesian grid. Figures 1 to 2 illustrate the grid options in the horizontal plane.

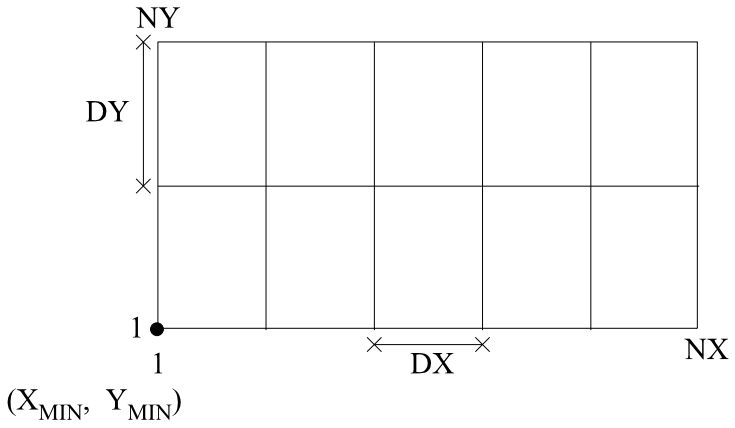

Figure 1 Regular Grid

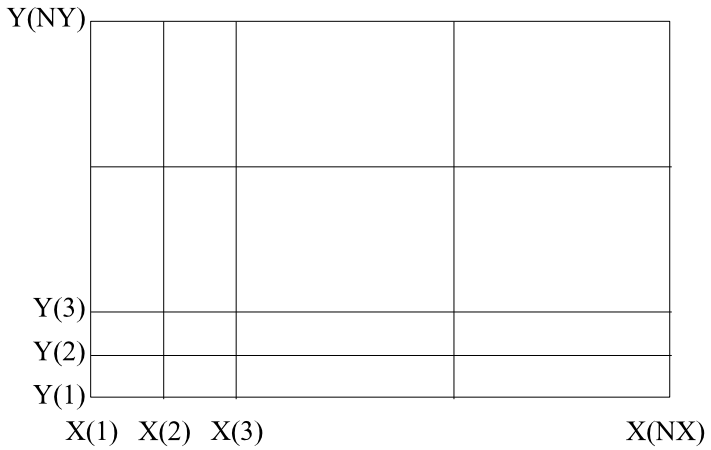

Figure 2 Variable Grid

2.2 Specified Points

Specified points may be defined with respect to Cartesian coordinates (X, Y, Z). The points may be at different heights, Z, and must be in the same coordinate system as the gridded output if both gridded and specified output points are being used. Each receptor may be given a name of up to 30 characters.

As well as entering specified points in the interface, extra specified points may be defined using an 'additional specified points' file, which is a comma-separated text file with the extension *.asp* that contains a line of data for every extra specified point required. Each line of data contains the point's name, X coordinate, Y coordinate and Z coordinate, in that order.

3. Calculation Grids

In order to calculate the concentration at each output point, it is necessary to transform to a coordinate system centred on the source, with the x-axis aligned along the wind direction. An internal calculation grid is used to ensure that the results are independent of the resolution of the user-defined output domain. The internal calculation grid is given by

$x(I) = \left(50{,}001^{1/250}\right)^{I} - 1$ for convective conditions, and

$x(I) = \left(50{,}001^{1/200}\right)^{I} - 1$ for stable and neutral conditions,

where x is the downwind distance from the source in metres. Dispersion calculations can then proceed as described in P10/01&P12/01. As dispersion calculations only need to continue downstream until the downstream edge of the output domain is reached, the number of internal grid points at which calculations are carried out depends on the extent of the output domain.

Concentrations at the user-defined output points (X, Y, Z) are calculated by transforming the output points to the wind-aligned coordinate system, so the new coordinates are (X', Y', Z) where X' is the downwind distance of the output point from the source, and Y' is the crosswind distance (Figure 3). The output point heights Z are unaffected by the transformation. The dispersion parameters from which the concentrations are calculated are obtained by interpolating from the internal calculation grid points.

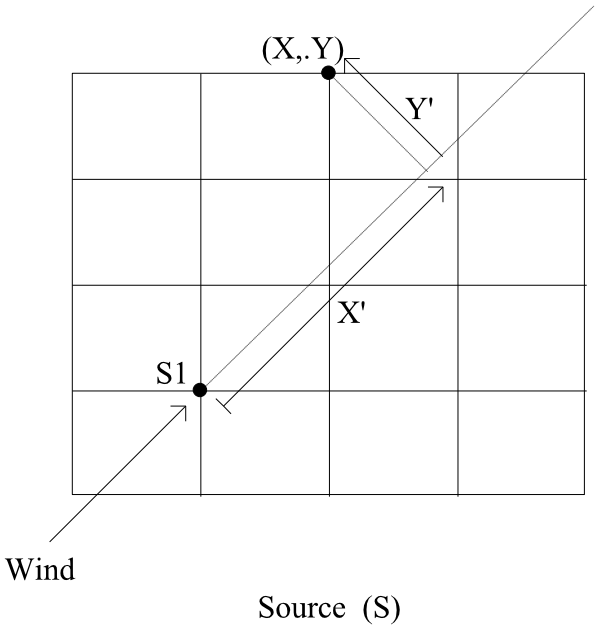

Figure 3 Original and wind-aligned coordinates of output point

APPENDIX Maximum and Minimum Values of Output Parameters

1. Gridded Output

(i) Regular Cartesian Grid

XMIN, XMAX	min: –9 999 999 m	max: 9 999 999 m
YMIN, YMAX	min: –9 999 999 m	max: 9 999 999 m
ZMIN, ZMAX	min: 0 m	max: 15 000 m (ADMS 6) 3 000 m (other models)
NX, NY	min: 1	max: 2001
NZ	min: 1	max: 501

(ii) Variable Cartesian Grid

X(I), I=1, NX	min: –9 999 999 m	max: 9 999 999 m
Y(J), J=1, NY	min: –9 999 999 m	max: 9 999 999 m
Z(K), K=1, NZ	min: 0 m	max: 15 000 m (ADMS 6) 3 000 m (other models)
NX, NY, NZ	min: 1	max: 100

2. Specified Point Output

(i) Cartesian coordinates

X, Y	min: –9 999 999 m	max: 9 999 999 m
Z	min: 0 m	max: 15 000 m (ADMS 6) 3 000 m (other models)