

Welcome to the on-line users' guide of SPRAY

Lagrangian particle dispersion model

This manual refers to both versions 3.2.0 and 3.1.15, being these two versions the same from the functional point of view. From this point on, the manual will use SPRAY 3.1 as a reference, but the content is valid also for SPRAY 3.2.0. **SPRAY** is a three dimensional model designed to simulate the airborne pollutant dispersion, able to take into account the spatial and temporal inhomogeneities of both the mean flow and turbulence.

Concentration fields generated by point, areal or volume sources can be easily simulated by this model. The behaviour of the airborne pollutant is simulated through “**virtual particles**” whose mean movement is defined by the local wind and the dispersion is determined by velocities obtained as solution of Lagrangian stochastic differential equations, able to reproduce the statistical characteristics of the turbulent flow.

Different portions of the emitted plumes can therefore experience different atmospheric conditions, allowing more realistic reproductions of complex phenomena (low windspeed conditions, strong temperature inversions, flow over topography, presence of terrain discontinuities such as land-sea or urban-rural), hard to simulate with more traditional approaches like the Gaussian one.

Current version 3.2.0 - 3.1.15 (functionally equivalent)

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Previous versions

[3.1.13](#)

[3.1.12](#)

[3.1.11](#)

[3.1.10](#)