SPRAY3
Lagrangian particle dispersion model

Purpose
Diffusion of non-reactive airborne pollutants in complex terrain:
• case studies, episodes analysis
• integrated supervision and control systems for industrial sites
• forecast of critical situations for pollutants concentrations

Spatial scale
Micro, local, urban and regional scale

Input data
• Site orography and land-use
• Meteorology: wind and temperature (3D) from diagnostic or prognostic model
• Turbulence: 2D fields of geophysical parameters (roughness, albedo, Bowen ratio) and local meteo data time series (solar radiation, vertical temperature gradient), or 2D fields of scaling PBL parameters \( (u_*, H_{mix}, w_*, L) \) from SURFPRO
• Istantaneous or continuous emissions from point, line, area and volume sources

Output
• Position of computational particles, “tagged” by source, mass or age
• 3D air concentrations and ground depositions of different species

Main features
• Internal reconstruction of 3D turbulence from ground and profile meteo data
• Dynamic plume rise
• Explicit treatment of wind calms, inversions, sites with strong spatial discontinuities (land-sea, urban-rural)
• Treatment of dry/wet deposition and radioactive decay

Meteorological and emission drivers
MINERVE, RAMS, SURFPRO, TREFIC, Emission Manager