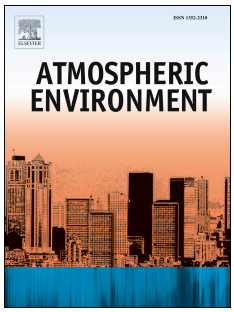
Accepted Manuscript



Validation of a Lagrangian particle dispersion model with wind tunnel and field experiments in urban environment

S. Trini Castelli, P. Armand, G. Tinarelli, C. Duchenne, M. Nibart

PII: S1352-2310(18)30566-1

DOI: 10.1016/j.atmosenv.2018.08.045

Reference: AEA 16213

To appear in: *Atmospheric Environment*

Received Date: 12 April 2018

Revised Date: 24 July 2018

Accepted Date: 21 August 2018

Please cite this article as: Trini Castelli, S., Armand, P., Tinarelli, G., Duchenne, C., Nibart, M., Validation of a Lagrangian particle dispersion model with wind tunnel and field experiments in urban environment, *Atmospheric Environment* (2018), doi: 10.1016/j.atmosenv.2018.08.045.

We present and evaluate a modelling approach that is a compromise between accuracy and timeliness of the computations for simulating unexpected releases in built environments. (P)MSS, a 3D Lagrangian Particle Dispersion model driven by 3D flow and turbulence input, is applied. The modelling system is validated on a panel of experimental test-cases from the Cooperation in Science and Technology (COST) Action ES1006 in both idealized and realistic urban mock-ups, wind tunnel and in-field trials, continuous and puffs releases. Results show that the model is compliant with the validation criteria in the large majority of the test-cases. The modelling system provides reliable results and it is prone to quickly inform about the distribution of possibly noxious materials in built-up populated areas.