

**17th International Conference on  
Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes  
9-12 May 2016, Budapest, Hungary**

---

**CFD-RANS PREDICTION OF INDIVIDUAL EXPOSURE FROM CONTINUOUS RELEASE OF  
HAZARDOUS AIRBORNE MATERIALS**

*George C. Efthimiou<sup>1</sup>, Spyros Andronopoulos<sup>1</sup>, John G. Bartzis<sup>2</sup>*

<sup>1</sup>Environmental Research Laboratory, INRASTES, NCSR Demokritos, Patriarchou Grigoriou &  
Neapoleos Str., 15310, Aghia Paraskevi, Greece

<sup>2</sup>University of Western Macedonia, Dept. of Mechanical Engineering, Sialvera & Bakola Str., 50100,  
Kozani, Greece

**Abstract:** One of the key issues of recent research on the dispersion inside complex urban environments is the ability to predict individual exposure of an airborne material which is released continuously from a point source. The present work addresses the question whether the Computational Fluid Dynamics (CFD) – Unsteady Reynolds Averaged Navier Stokes (URANS) methodology can be used to predict individual exposure for various exposure times. The whole effort is focused on the prediction of individual exposure inside a complex real urban area. Sensitivity analysis for the turbulence closure modeling is also performed. The capabilities of the proposed methodology are validated against wind tunnel data. The reference data set was compiled by members of COST Action ES1006. The provision of reference data is gratefully acknowledged.