

Abstract Submitted  
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**LES study of polluted dust dispersion in a Trieste densely populated area**<sup>1</sup> VALENTINA STOCCA, University of Trieste, FRANCESCO MONTANARI, FULVIO STEL, ARPA-FVG, VINCENZO ARMENIO, University of Trieste, KATEPALLI R. SREENIVASAN, ICTP — Large eddy simulations are employed to study dispersion of pollutants in urban areas. We have developed the model LES-AIR to accurately predict under critical wind conditions the dispersion of dust from polluting steelworks. The model is applied to the study of a suburban area of Trieste, where the coexistence of an obsolete steel plant and civil habitation within few square kilometers has led to serious health risks. LES-AIR is a curvilinear, second order accurate, finite difference, large eddy simulation solver. The LES-AIR sub-grid model, whose validity has been tested against previous numerical studies of the atmospheric boundary layer, is a mixed model composed of a Smagorinsky and a scale-similar part. We have simulated a domain extending 1.5 km x 1 km in horizontal directions, and 0.6 km in the vertical. The combined usage of a terrain following curvilinear coordinate system, which uses a refined grid in the near ground region and the immersed boundary technique, allows us to realistically reproduce the shapes of buildings. The model validation as well as results from the LES-AIR Trieste case study will be presented.

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Valentina Stocca  
University of Trieste

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