Simulation of anisotropic pollution dispersion in urban environments[1] RAFAEL IZARRA-GARCIA, Universitaet Siegen — The prediction accuracy of air flow in urban environments is strongly dependent on the selection of the turbulence model for Reynolds stresses. In case of pollution dispersion simulations, a model for the turbulent scalar fluxes is also needed and it is usually performed with the simple isotropic gradient diffusion assumption. In the present work, the influence of advanced anisotropic models for the turbulent scalar fluxes is studied and compared with two wind tunnel experiments (2D and 3D). Five anisotropic algebraic flux models, two second moment models and the simple gradient diffusion model (at various Sct) were implemented in FLUENT 6.3 and compared using statistical performance measures. The results showed general good predictions for most scalar flux models with unexpected poor improvements of the anisotropic models over the isotropic and a lack of model coefficient calibration for pollution dispersion applications. Finally, simulation improvements, sensitivity of model coefficients and several parameters and assumptions needed for this application are discussed.

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