The incorporation of computational fluid dynamics (CFD) capabilities with RISK, an indoor air quality zonal model developed by the U.S. EPA DAVID MARR, U.S. EPA — Individual exposure to indoor contaminant concentrations is often estimated using assumptions of fully mixed conditions. The applicability of such an assumption can vary significantly based on the ventilation design and contaminant of interest. To solve for gradients in the contaminant concentration field, a CFD solver has been added to RISK, the primary indoor air quality model developed by the U.S. Environmental Protection Agency. The RISK model was created to solve for "zonal" concentrations based on emission characteristics of indoor materials and emission sources. Current updates to this model allow for a greater resolution and therefore more detailed view of risk and exposure in the indoor environment towards risk management. CFD results are compared to particle image velocimetry (PIV) experimental databases acquired at the U.S. EPA and Syracuse University. This presentation includes a brief overview of the model capabilities, steps towards validation of the model output, and examples of indoor contaminant transport from common indoor material emissions.

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