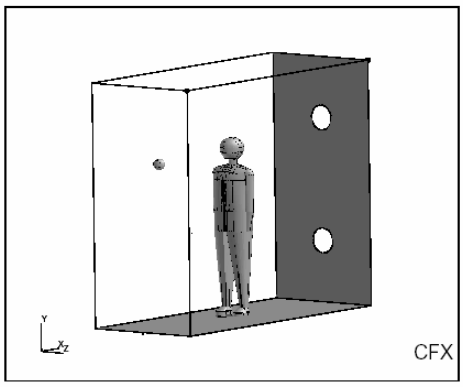
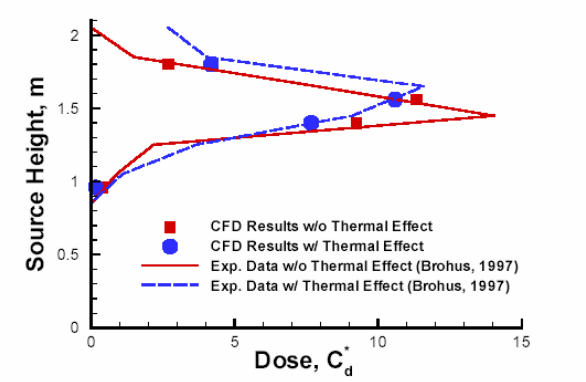
Hyun, S. and C. Kleinstreuer, Computational Exposure and Dose Assessment Analysis for Transient Turbulent Flow and Gaseous Pollutant Transport, Air Distribution in Rooms (ROOMVENT 2000), Elsevier 2000.

The experimentally validated CFD simulations of transient turbulent air flow and gaseous pollutant transport in a personal exposure environment are studied. Here, the personal exposure condition is the pollutant gas concentration surrounding a subject which is different from personal dose condition of a breathing subject. The purpose of this paper is to examine the effect of transient breathing on ambient trace gas concentrations and uptake concentrations. The system consists of a unidirectional flow chamber and a passive, spherical pollutant gas source, e.g., CO or NO_2. Personal exposure and dose assessment are determined by means of a breathing, non-isothermal manikin positioned in the chamber centre facing different directions. The transient three-dimensional turbulent thermal flow and the mass transfer problem have been solved on a multi-processor SGI Workstation (Origin 2000) using CFX 5.3 (AEA Technology) with modified programs.





CFD model for a BTM and the breathing waveform.