

Abstract Submitted  
for the DFD07 Meeting of  
The American Physical Society

**Exposure assessment involving entrainment during human motion in the indoor environment** DAVID MARR, IAN SPITZER, MARK GLAUSER, Syracuse University — Recent experimental studies have shown the effects of motion on the human thermal plume (Settles). When utilizing low speed ventilation designs, this natural convection is a primary driving force of the flow. Interference with this flow reduces the effectiveness of a displacement design and therein reduces air quality and comfort levels in the indoor environment. Human motion has been found to increase mixing in a room (Mora and Gadgil) with displacement ventilation, a negative effect due to the nature of the design. This investigation is the culmination of PDA and PIV measurements around a thermal manikin and the direct impact seated human rotation has on air velocity, particle concentration and size associated with the thermal plume. This common indoor motion in a cubicle setting may assist in exposure studies and ventilation design to determine the effectiveness of displacement style ventilation in a near realistic setting.

Mark Glauser  
Syracuse University

Date submitted: 06 Aug 2007

Electronic form version 1.4