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Computational and experimental study of airflow around a fan powered UVGI lamp SRIKAR KALIGOTLA, Syracuse University, BEHTASH TAVAKOLI, Clarkson University, MARK GLAUSER, Syracuse University, GOODARZ AHMADI, Clarkson University — The quality of indoor air environment is very important for improving the health of occupants and reducing personal exposure to hazardous pollutants. An effective way of controlling air quality is by eliminating the airborne bacteria and viruses or by reducing their emissions. Ultraviolet Germicidal Irradiation (UVGI) lamps can effectively reduce these bio-contaminants in an indoor environment, but the efficiency of these systems depends on airflow in and around the device. UVGI lamps would not be as effective in stagnant environments as they would be when the moving air brings the bio-contaminant in their irradiation region. Introducing a fan into the UVGI system would augment the efficiency of the system's kill rate. Airflows in ventilated spaces are quite complex due to the vast range of length and velocity scales. The purpose of this research is to study these complex airflows using CFD techniques and validate computational model with airflow measurements around the device using Particle Image Velocimetry measurements. The experimental results including mean velocities, length scales and RMS values of fluctuating velocities are used in the CFD validation. Comparison of these data at different locations around the device with the CFD model predictions are performed and good agreement was observed.

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