

New Model to Predict Aerosol Dispersion in Ventilated Rooms

Original Article

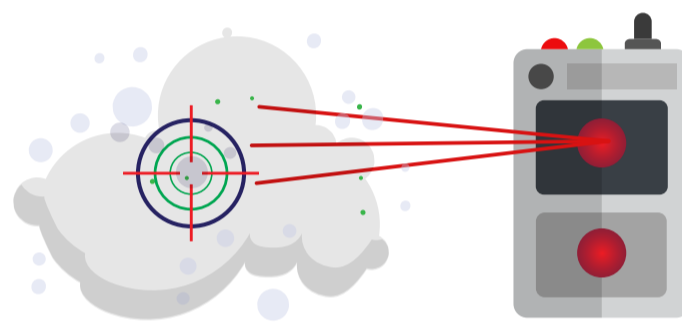


Aerosols often transmit respiratory diseases, but computations predicting their dispersion in indoor environments are not often experimentally verified

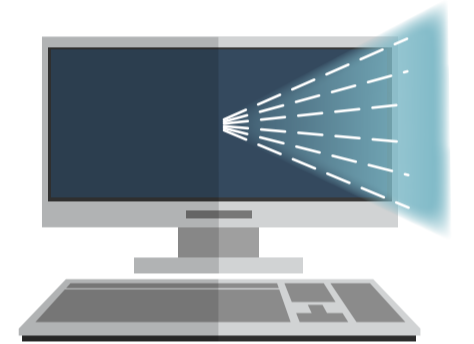
A fast and scalable aerosol-transport simulation and prediction model which can be adapted to indoor environments is needed

Developing a new model

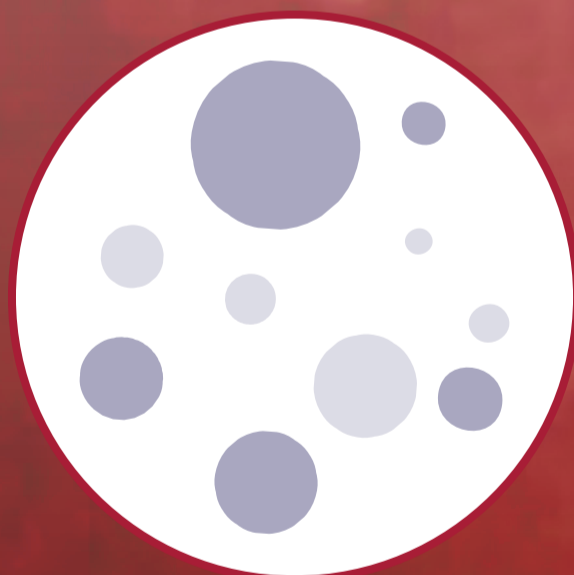
Experimental measurements taken via an optical particle sensor network



Aerosol dispersal and loss rates computed by a steady-state Reynolds-Averaged Navier-Stokes k-epsilon model with size-dependent aerosol recirculation



What did the new model find?



Aerosol droplet size



Aerosol recycling



Recycled-to-outside air ratio



Aerosol recirculation is not negligible

Aerosol concentration was found to decay much slower than predicted based on ventilation rate; size-dependent aerosol recirculation was discovered