Investigation of the Covid-19 Propagation in Conference Room

DAO THI HUYEN, 김교선†
강원대학교
(kkyoseon@kangwon.ac.kr†)

The world is now facing the Covid-19 pandemic and understanding the detailed transmission mechanisms is important. Although the models for evaporation and trajectory of respiratory droplets have been developed, it is not still clear how the environmental conditions affect the transmission of Covid-19. This study applied computational fluid dynamics (CFD) simulation to investigate the propagation of droplets generated by speaking activity in a conference room under different environmental conditions. We found that relative humidity (RH) and temperature are critical factors that affect droplets dispersion. It is found that, in an environment with low temperature and low RH, the droplets carrying viruses shrink in size quickly by evaporation and are suspended in the air for a longer time. When the ambient temperature is 20°C and RH is 30%, the time required for 50 μm droplet to evaporate is 1.7 sec and, at RH = 90%, it becomes 5.4 sec. In the room with air conditioner on, droplets can travel farther by gas flow from air conditioner and the droplet concentration becomes higher. This study will contribute to a better understanding of the environmental impact on Covid-19 transmission.