Essentially, the tool performed well thus allowing the withdraw of some conclusions regarding particle flow process. Although, the tool’s inferences are still rudimentary, as more details can be addressed in a future work such as the production of a histogram regarding the particle dimensions that attached in relevant surfaces, as well as the residence time for those particle ranges in order to correlate each size interval to a certain danger level in function of time and particle size.

V. Conclusion

This paper focused on the development and implementation of an animated tool that allowed the simulation of particle flow in different environments. The animated tool established was composed of 4 different software interconnected: *DesignBuilder*, *OpenFOAM, ParaView* and *Microsoft Excel*.

In particle flow simulations two steps are required to be fulfilled: first, it is necessary to simulate the airflow developed in the physical space and only then, it is possible to perform the particle flow simulation. To test the tool development, different scenarios were analysed by variating the configurations of the room as well as the breathing regimes simulated. However, as mentioned, first it was required to simulate and validate the airflow, having used for this purpose the work conducted in [7].

It was found that the tool performed well, since it was possible to withdraw some conclusions regarding the particle flow, since in the comparison made between 3 of the several scenarios, for the given simulation time, it was possible to determine the particle removal efficiency by the ventilations systems implemented in the room, whether they were mechanical or natural, the scenario where the humans were most infected, as well as the particle percentage that was still airborne.

Nevertheless, the tool can still be improved, since several factors inherent to the particle flow process were not addressed such as the production of a histogram regarding the particle dimensions that attached in relevant surfaces, as well as the residence time for those particle ranges in order to correlate each size interval to a certain danger level in function of time and particle size. In addition, in a future work the tool can also be upgraded with the emphasis being on interconnectivity, and dynamism between the different software implemented, as these aspects are still rudimentary at the current stage.

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