

Speaker: Dr Florent Duchaine, Cerfacs

Title: **CFDforCOVID**

Abstract

The Covid-19 pandemic has caused us to re-examine many aspects of our lives since the beginning of 2020 such as social distancing and masks to limit contagions. These recommendations are mainly based on old studies and researches have to be carried out in order to improve the knowledge on contagions. In this context, many recent studies have pointed out the role of airborne transmission. The CFDforCOVID PRACE project, led by Florent Duchaine of CERFACS, has been using fluid dynamics tools usually reserved for aeronautical engines (aircrafts and helicopters) to look at how the virus can spread in enclosed environments such as buildings and vehicles, with the aim of helping to turn them into safer spaces that reduce viral transmission.

Although a lot of focus is placed on the spread of infection through individuals coughing or sneezing, more and more studies have pointed towards the fact that respiratory droplets that are released just from talking and breathing can travel considerable distances. These droplets can easily flow around enclosed spaces due to convection currents created by ventilation systems. The 10 million core hours awarded on Joliot-Curie Rome have been used to simulate the emission and dispersion of droplets containing virus in an office as well as in a bus under different ventilation conditions. Results illustrate the strong impact of the ventilation systems on the spread of respiratory droplets.



Short bio

Dr Florent Duchaine is a researcher at Cerfacs since 2010. His research interests include conjugate heat transfer in gas turbine components with the coupling of Large Eddy Simulation, radiation and conduction as well as Large Eddy Simulation of turbomachinery stages. Recently, he extended his activities to Large Eddy Simulations of biological droplet dispersion mainly for the study of transmission of COVID-19. He has authored about 50 papers in refereed journals and 60 communications in international conferences. He is a member of the ASME Heat Transfer Committee since 2020.