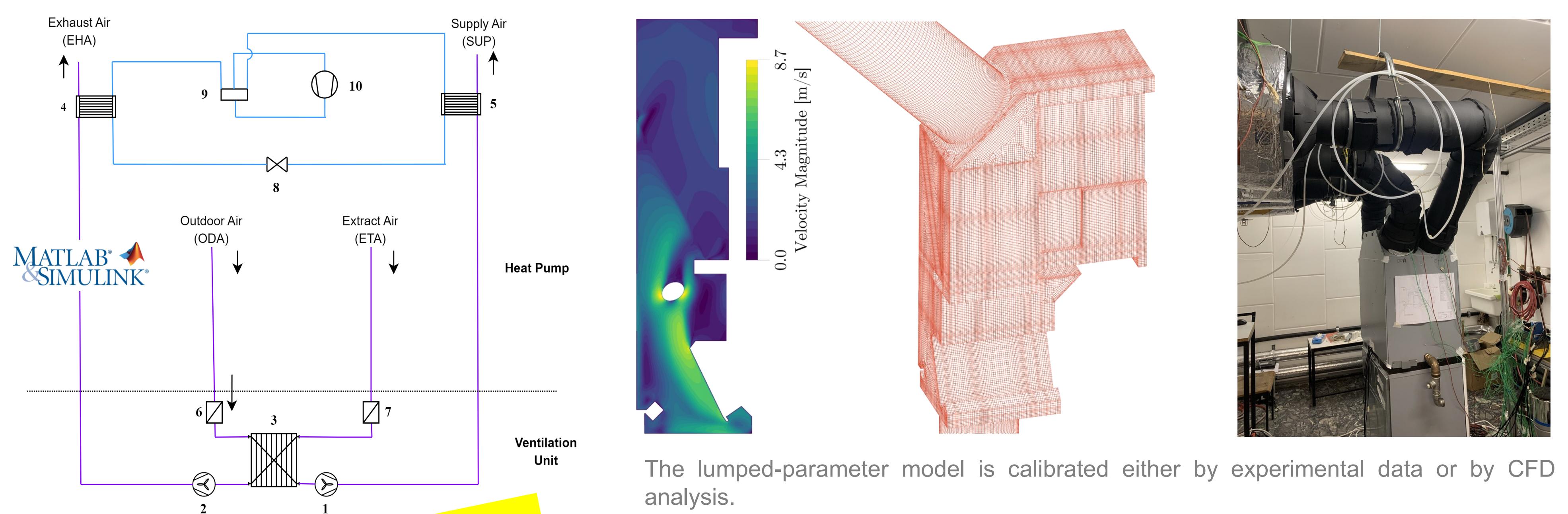


# RENEWABLE ENERGY, ENERGY EFFICIENCY AND TRANSPORT PHENOMENA IN BUILDINGS

Roberto Sedoni, Ludovico Campanelli, Danila Trane, Mattia Grespan, Adriano Leonforte, Marco Cavazzuti, Paolo E. Santangelo, Diego Angeli

## DIGITAL TWIN OF A MULTIFUNCTIONAL VENTILATION UNIT

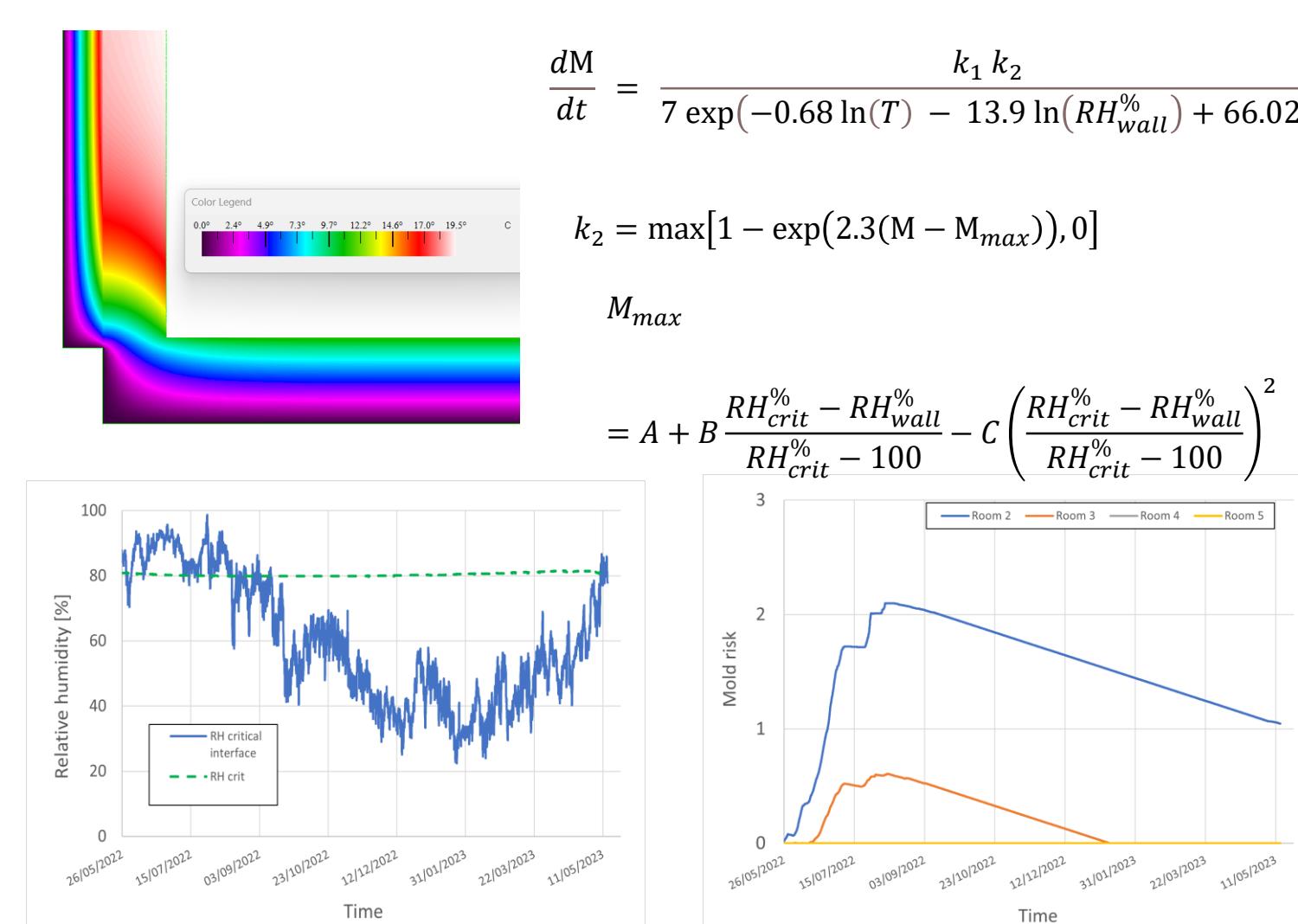
The objective of the research project is to develop a digital-twin of an innovative system that combines a ventilation unit and an air-to-air heat pump to optimize energy consumption and provide comfort in residential buildings



In collaboration with  
Zehnder Group Competence Center Campogalliano (Italy)

## INDOOR AIR QUALITY

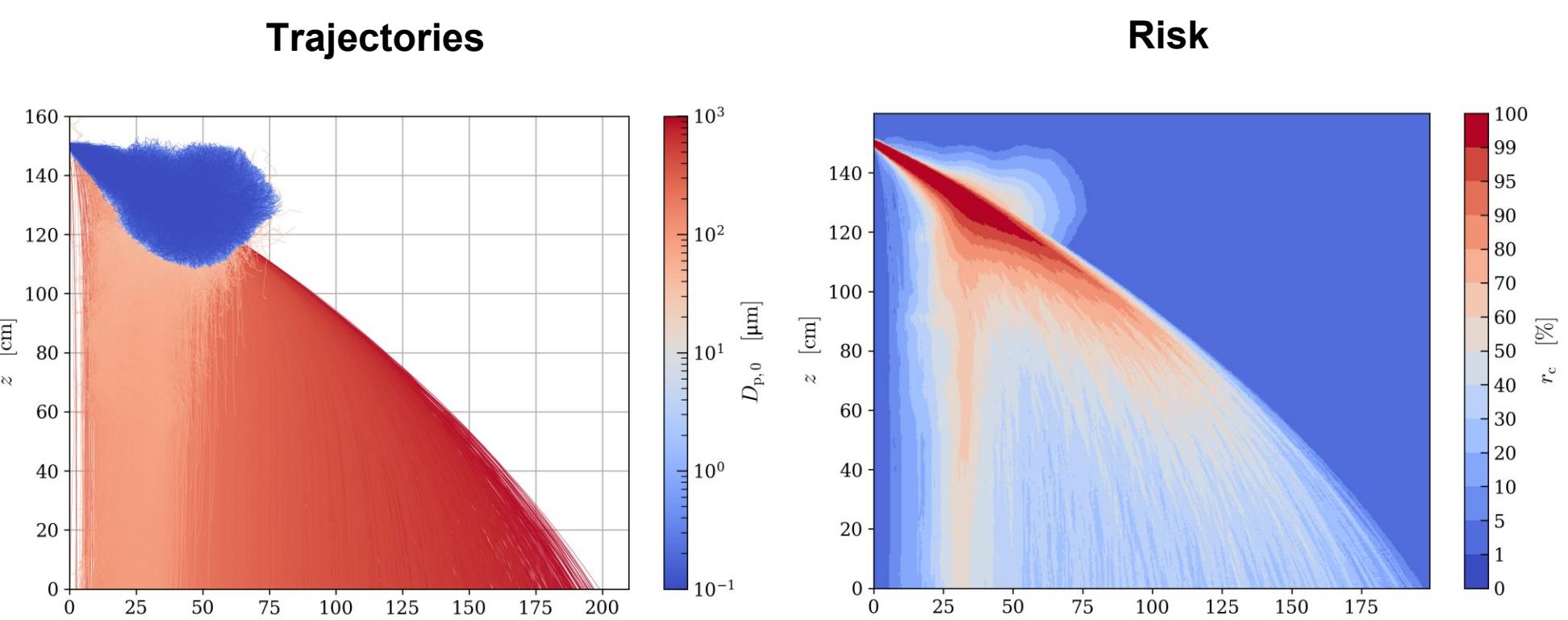
### Risk assessment associated to mold growth



### Risk assessment associated to exhaled droplets

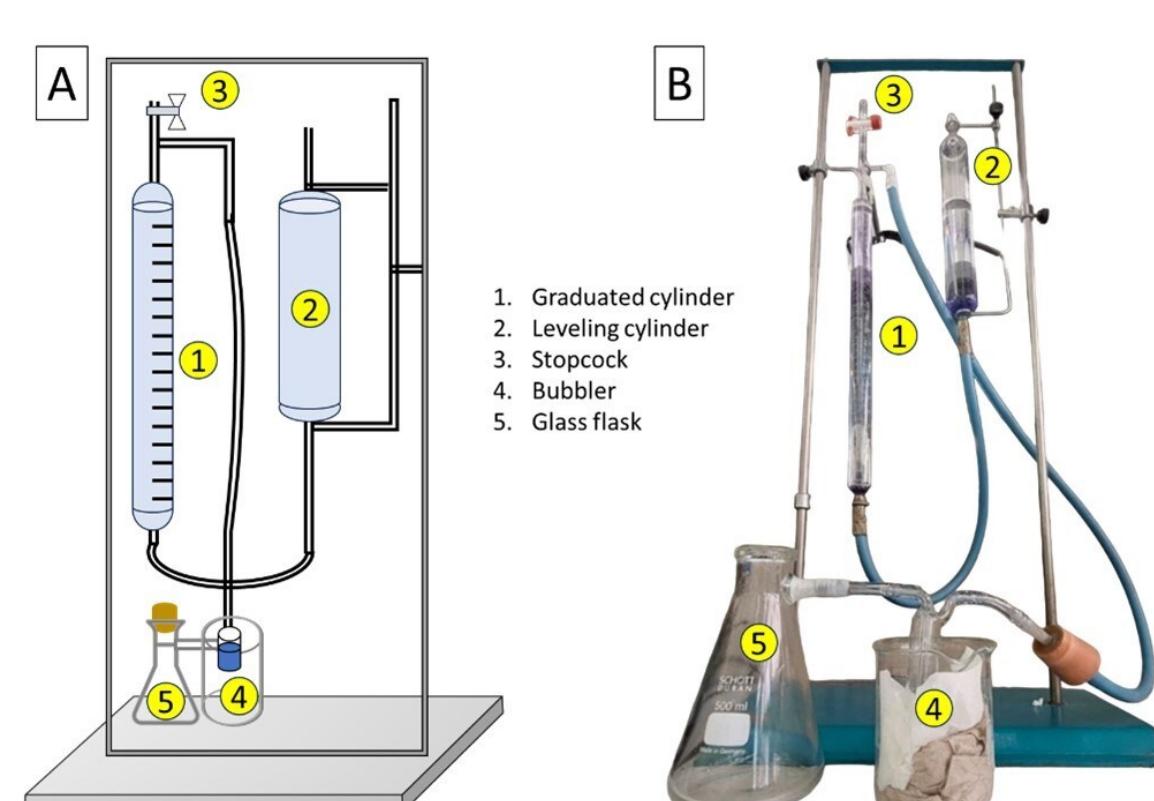
Statistical model describing the coughing scenario of a SARS-CoV-2 infected individual.

Spatial risk maps are derived by post-processing the droplets trajectories



## HYDROGEN PRODUCTION AND FUEL-CELL MANUFACTURING

Hydrogen production by aluminum/water reaction:  
Experimental study of chemical kinetics as a  
NaOH/H<sub>2</sub>O solution is involved



In collaboration with  
Laboratorio di Reologia @ DIFE, UNIMORE

Deposition of functional layers for PEMFC (Polymer Electrolyte Membrane Fuel Cells) manufacturing:  
Focus on coating and printing techniques

