

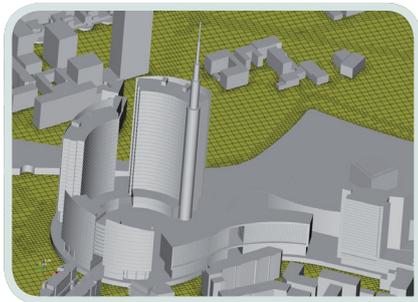


# KARALIT CFD FOR PEDESTRIAN COMFORT AND SAFETY



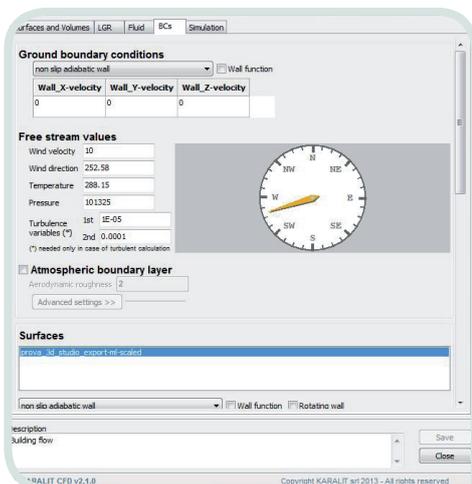
## CASE DESCRIPTION: OUTDOOR AIRFLOW EXAMPLE.

When designing a new park, subway station or other public structure, architects need to go beyond aesthetics to ensure pedestrian comfort and safety. In addition to meeting government regulations, they need to be concerned about positioning of buildings and trees, ventilation outlets, and orientation of escape routes. Safety measures and procedures also need to be developed in case of emergencies such as fire, flooding and even terrorist attacks. Also natural convection in buildings and heat islands in urban environments can be considered. Another consideration is high winds introduced by high-rise buildings. These can lead to uncomfortable or even dangerous conditions. In this case study, winds blowing around buildings are simulated to ensure pedestrian comfort and safety.



## FAST SETUP WITH NO PRE-MESHING.

Using the power of the Immersed Boundary (IB) method in KARALIT, a complex urban environment like the one in this example, can be immersed into an anisotropic refined cartesian background grid. Preprocessing takes just seconds, as the user does not have to deal with time-consuming mesh generation.



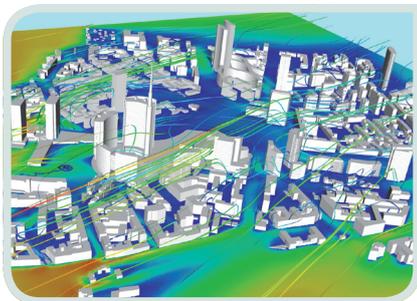
## EASY SETUP THROUGH THE USE OF APPS.

Case setup is further simplified by using KARALIT's customized Building Flow app. The app automatically sets up the simulation in seconds after the user inputs a few key boundary condition values. It takes just a few clicks of the mouse to add a new building within an existing urban area or to modify the location of an existing building. KARALIT CFD allows designers to benchmark the potential performance of proposed modifications against the existing installation. It enables them to anticipate areas where improvements might not be satisfactory, explore available options, and communicate design-critical information to clients. Building simulation results in better-informed designers and clients, increasing the likelihood of project success.

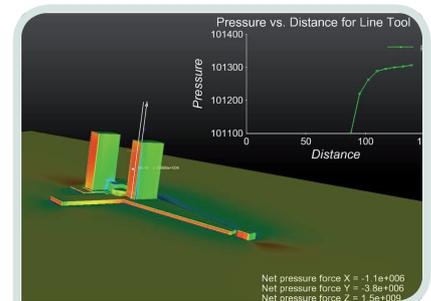
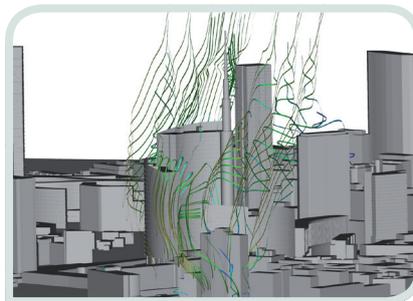


## RESULTS VISUALIZATION.

The results of simulations can be quickly visualized with the integrated KARALIT CFD visualizer but also with popular software such as Tecplot, Ensignt and Paraview, activated directly from within KARALIT CFD at the touch of a button.



Velocity distribution at a specified height from ground, to assess the compliance of the design in evaluating any possible discomfort of the pedestrian around specific urban areas.



An example of how KARALIT CFD can be also useful to determine the pressure and forces distribution over a building facade, in order to give to the civil engineer or architect the right informations for a subsequent structural analysis.

### Immersed Boundary (IB) method for:

- Saves up to 99% in user time by eliminating the need for pre-meshing
- Faster turnaround time to reach a solution
- Reduces manual preprocessing work
- Increases accuracy by solving on rectangular grids
- Focuses engineering resources on analysis, not preprocessing

### Customized apps:

- Fast case setup
- Minimum effort to set up complex CFD simulations
- Easy setup for parametric analyses
- Ideal simulation tool for moving objects
- Ultimate engineering "what-if" design tool

### Value-based pricing:

- Pay nothing extra to add hardware
- Unlimited parallel processing
- All inclusive
- Easy budgeting

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