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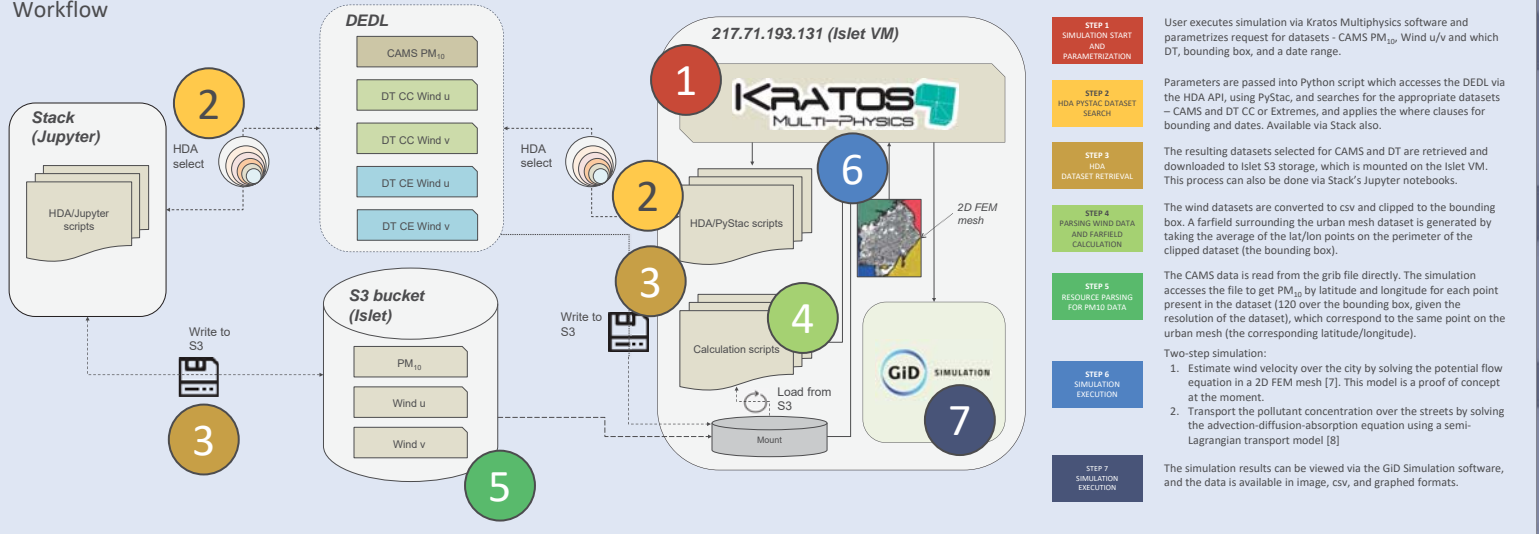
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## Motivation

Over 75% of citizens in urban areas are exposed to levels of pollution above the limits established by the World Health Organization [1], making air pollution an environmental issue of public interest. Several pollutants can be found in cities, but as many studies indicate, particulate air pollutants (PM<sub>2.5</sub>, PM<sub>10</sub>, black carbon, dust, aerosols, etc.) can have a direct negative effect on health [2,3,4]. Such particulate air pollutants are composed of a number of solid and liquid substances which can be derived both from human activity such as road traffic, industrial processes and construction works, and from natural sources such as dust storms, volcanic eruptions and forest fires [5,6].

The **main goal** of the present use case is to implement and test a simplified potential flow-based urban-scale particulate air pollutant predictive tool in the city of Barcelona. Succeeding in this work means that decision-makers will have a practical forecasting tool that can effectively guide them in the local-scale management of urban areas.

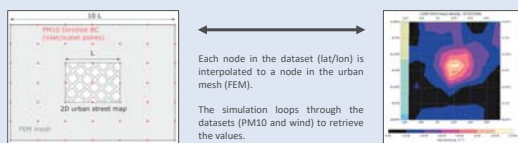
## Workflow



## DEDL datasets used

<p>European Air Quality Forecasts PM<sub>10</sub> (10µ) particulate matter (1.554252, 40.94932, 2.762153, 41.858645)</p>	<p>Digital Twin: Climate Change Adaptation / Climate Extremes 2m temperature and 30m wind forecast (u/v)</p>	<p>2D finite element method (FEM) mesh of Barcelona and environs: (1.554252, 40.94932, 2.762153, 41.858645)</p>

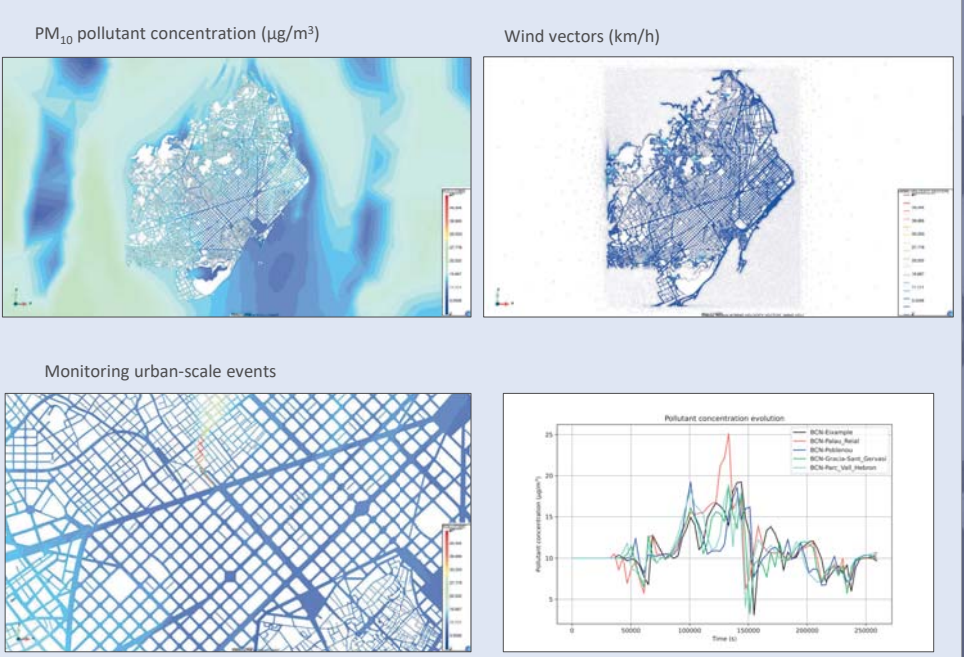
## Correspondence of nodes



## Highlights and future plans

- A practical demonstration of use of the DEDL and possibilities for reuse of resources on the DestinE platform.
- A numerical tool prototype able to provide a fast, urban-scale and short-term prediction of the particulate matter immissions in any street of an urban area.
- A robust computational framework that can be easily adapted to other transport problems such as nitrogen dioxide, odors, allergens, etc.
- Upgrade the current 2D potential flow solver to a 3D CFD model (future plan).
- Parametrization of all inputs to allow dynamic use of models and datasets – from DEDL and federated sources (future plan).
- Implement a web interface for easier end-user interaction and automatic triggering of threshold events (future plan).

## Results



## References

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