

## **EM simulation of a moving target and its moving multipaths to improve radar performance prediction.**

Electromagnetic (EM) simulation of targets moving in large complex scenes is useful for radar performance prediction. In radar, target parameters (range, Doppler, and angles) are affected by environmental multipath. The ability to predict the error (variance) of these parameters helps assess the radar performance expected in complex environments.

This PhD aims to improve the EM modelling to achieve the EM simulation of moving targets and their multipath in complex urban environments. The scope may include:

- Development of an EM model for simulating a moving target (UAV) with its changing multipath. Activities can include:
  - o Collection of anechoic chamber measurements using radar in an anechoic chamber
  - o Validation/corrections/modifications of the model of the simulation tool
  - o Assessment of polarimetry as a means to check the phase of the EM fields.
- After validation
  - o Analysis: The same configuration as an anechoic chamber will be validated in an outdoor urban environment.
  - o Simulation of the antenna and with a transmitter to illustrate multipath's impact on the UAV flying angle.
  - o If time permits, collection of the data antenna and a transmitter to study the impact of multipath on the angle of UAV flying.
  - o If time permits, development of angle correction techniques based on the modelling.