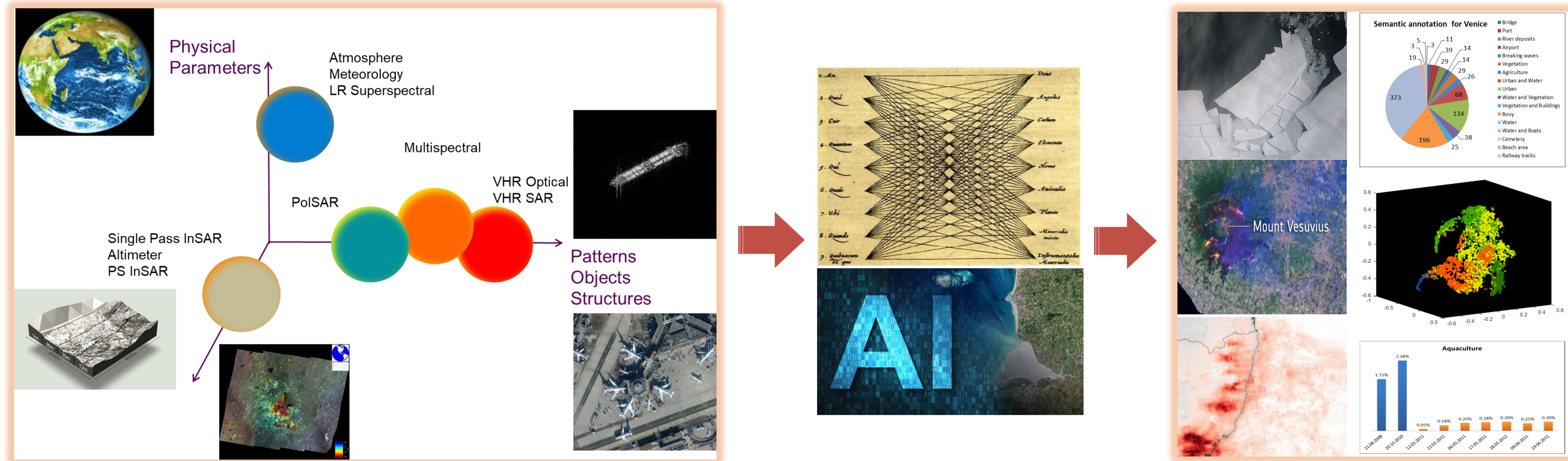


xAI – Explainable Deep Learning for Earth Observation

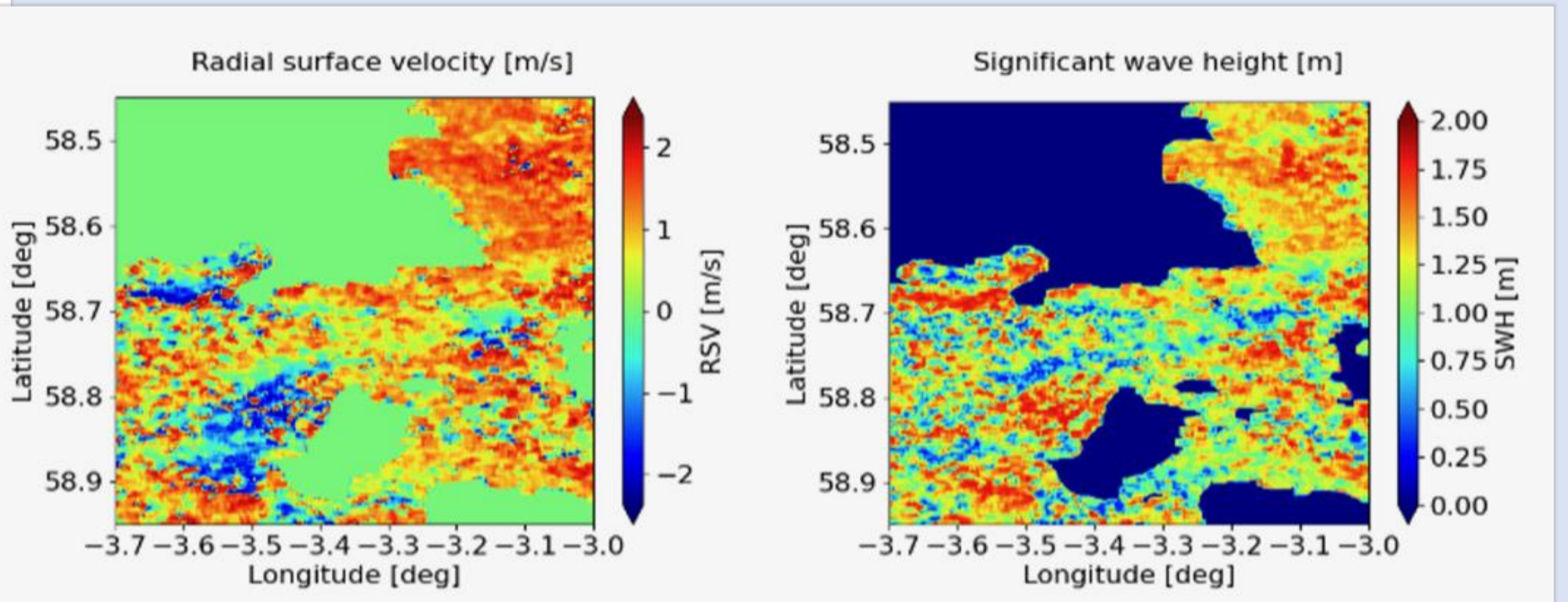
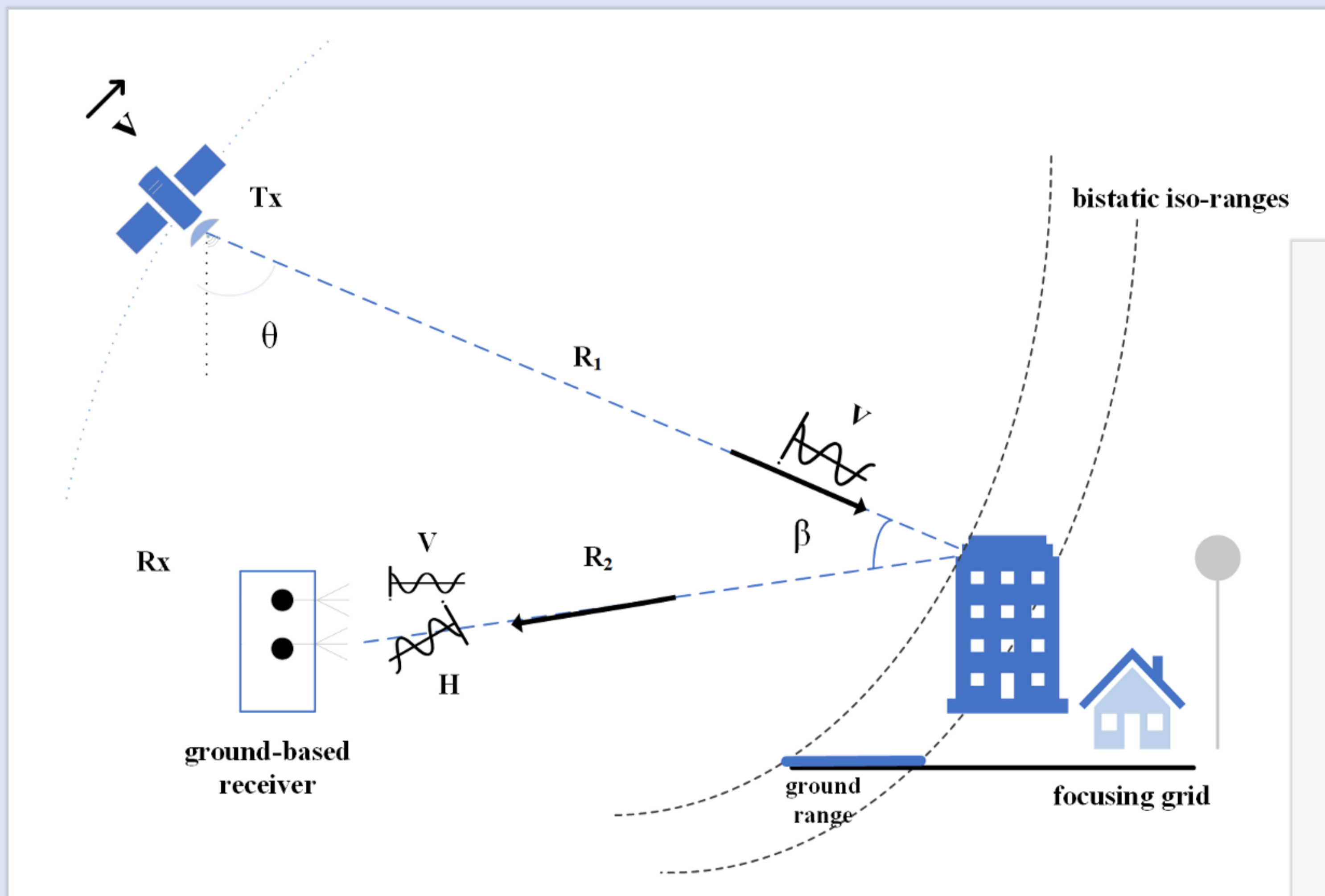
Lorena GALAN, Andrei ANGHEL, Daniela FAUR, Mihai DATCU

The roadmap towards bringing Earth science data closer to practical applications

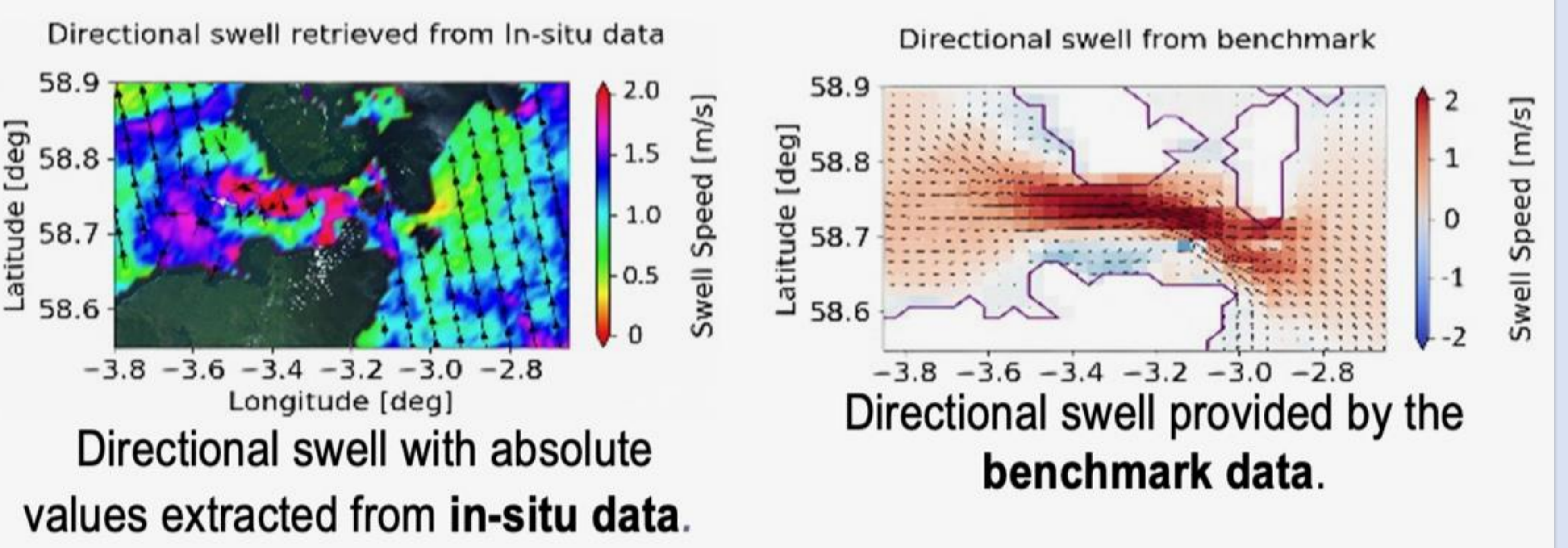


Artificial Intelligence (AI) is currently studied mainly for optical imagery, i.e. photography. Earth Observation (EO) images are basically different and much more complex. AI for EO requires specific methods for the full information extraction from spatial, temporal or spectral information at global scale. This involves new paradigms to analyze jointly multimodal sensor records as the EO multi-sensor data optical, IR or microwaves. EO records data of high complexity, physically-based, dynamic, non-linear coupled Earth System. We need to develop new AI paradigms with integrated physical principles into the learning mechanism. These are well beyond and do not emerge from the present cats and dogs recognition techniques. Thus, there is a huge motivation in developing AI for EO methods and exploiting the results.

Physics informed AI for EO



RSV (m/s) derived from SLC-IW data based on data-driven f_{DC} H_s (m) derived from RSV and averaged over the given period of time.



Directional swell with absolute values extracted from in-situ data. Directional swell provided by the benchmark data.

