Poster

Simulation of Extended Scenes for Radar Raw Data and SAR Image Simulation - ONERA, DEMR

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The EMPRISE project (Ensemble de Moyens de Production d'Images et Signaux EM) is led by DGA in collaboration with DGA-MI and ONERA. Its objective is to produce collaborative toolkits for modelling electromagnetic scenes. This includes reference EM data in a shareable framework used in simulation tools. One of these tools, STIMUSAR, is a radar simulation software for large geo-referenced scenes for applications ranging from maritime patrol for detection and tracking to wide field SAR imaging.

The main motivation is to produce data for training and validate radar processing algorithms. Simulation enables to create many data with different configuration instances, and the problem we are solving is to be able to perform fast simulation of real scenes that include varieties of objects and environments.

STIMUSAR has a modular architecture including a sensor model and a scene model to implement environments including terrain, forest, sea and cloud cover, as well as pre-calculated or measured targets. The simulator computes the radar raw data for the SAR focalization for scenes of several tens of kilometers for pulsed monostatic radar in the L- to Ku-band range. The data can be exported for the focalization, or it can directly be processed with the Back Projection algorithm included in the software suite.

The computation method is in time domain and can provide results for multi-channel modes. The interface allows the user to configure a radar sensor model with different generic radar strategies and processing.

Figure 1 : Example of simulated SAR image for a dock area. ONERA, DEMR-SEM/TSRE

References

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