

Sensor Emulation and Synthetic Data Generation

Topic Areas:

- Mission Engineering enabling T&E
- Authoritative source of Truth
- Acceleration of technology development and insertion
- Architecture and implementation of models for accelerated testing

ABSTRACT: The legacy approach of live testing new equipment in an operational environment has significant limitations: range access, cost of operation, collection geometries, measurement precision and position knowledge, and safety. Digital Engineering allows customers to create Virtual Testing environments of existing operational systems and future proposed systems. Digital Engineering is critical to support the development process, while system performance can be measured under an unlimited set of test scenarios. This allows the customer to explore various concepts prior to committing to hardware production.

ANSYS will present the recommended approach for a virtual test environment by implementing a solution to Digital Mission Engineering to virtually demonstrate collection operations at our national test ranges, emulating: vehicle operations, sensor collections, and data emulation. This implements ANSYS 3D virtual test range concept and full sensor emulation to produce synthetic RF sensor data generation for flight planning, sensor collection planning, pre-flight data value assessment, and ultimately offers unlimited data generation for AI/ML training and AI/ML algorithm operational validation. The approach implements our latest real-time data generation capability called GPU-SBR (fig 1) driven by Systems Toolkit to support Radar (SAR and ISAR), RF communication, and SIGINT scenarios.

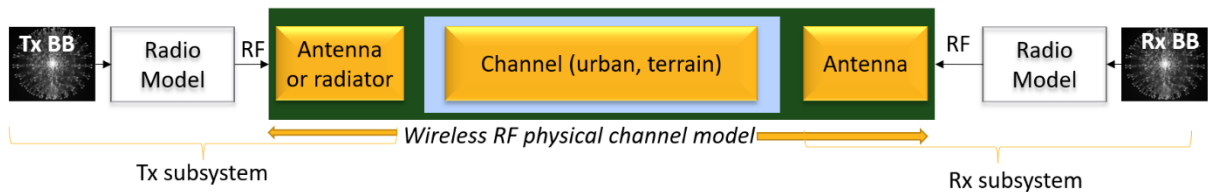


Figure 1: Wireless physical channel modeler provides channel modeling that includes high-fidelity antenna and array systems in the virtual environment