ANSYS®

EMIT

The ANSYS RF Option combined with ANSYS HFSS electromagnetic simulation software is a powerful tool for radio frequency (RF) circuit, component and system interference analysis, which can significantly boost the reliability and performance of wireless products. EMIT, a significant feature within ANSYS RF Option, enables RF system-level analysis necessary to identify and mitigate radio frequency interference (RFI) challenges in complex environments. EMIT ensures the integrity of wireless products by solving costly RFI problems before manufacturing.

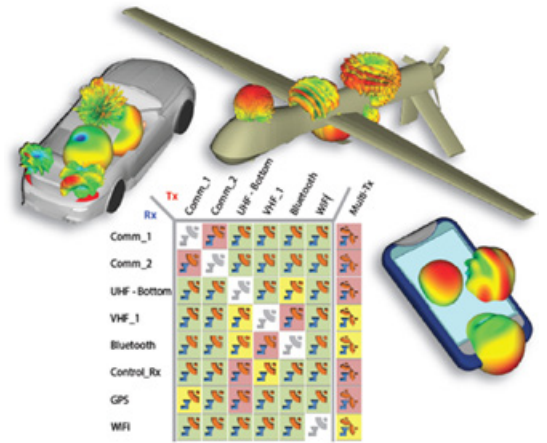## Radio Frequency Interference (RFI) Simulation in Complex Wireless Environments

EMIT is a powerful capability to manage RF system performance data, simulate cosite and coexistence RFI effects, and mitigate RFI issues, resulting in a complete model maintainable over the life of a multi-RF system platform or vehicle. EMIT enables a unique multifidelity approach to predict RF cosite/coexistence interference and swiftly identify and analyze the root cause of RFI issues in complex RF environments.

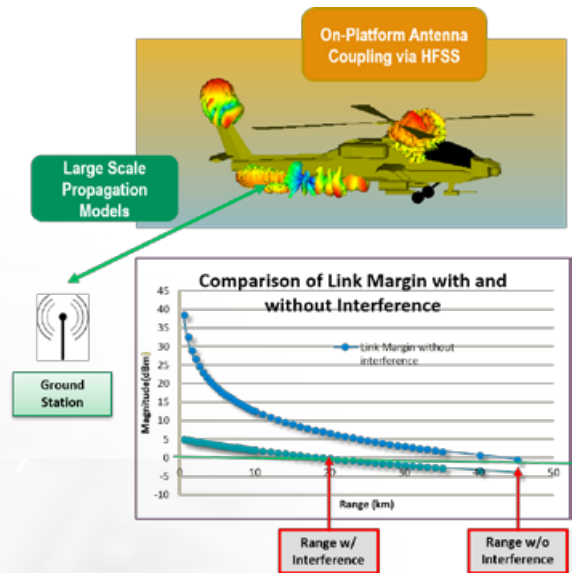## RF Link Budget Analysis for Wireless Systems

Link budget analysis provides the engineer with key performance metrics for wireless systems operating in complex environments where other radiating sources of potential interference are present. Built-in channel/propagation models quickly assess propagation loss, including fading, shadowing, rain and atmospheric attenuation, etc.

## Automated Diagnostic and Mitigation Tools

Automated diagnostic and visualization windows provide rapid root-cause analysis of complex RF scenarios and allow the engineer to quickly pinpoint potential critical issues affecting system performance. Visual signal traceback determines the path of interference and the exact causes, such as co-channel, adjacent channel, out-of-band and intermodulation interference. Once the performance bottlenecks are identified, mitigation measures can be applied.

EMIT predicts radio frequency interference (RFI) and RF link budgets in complex environments.

RF link budget analysis for quality of service
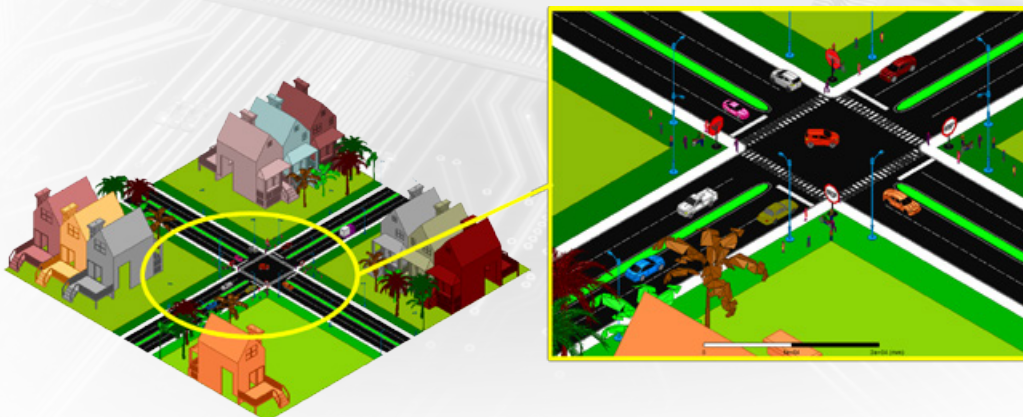
Wireless system performance in complex RF environments for (vehicle-to-vehicle) V2V and (vehicle-to-infrastructure) V2X communications

Multifidelity RF System Simulator

- Available system data found in manufacturer's specifications is sufficient for multifidelity modeling — this eliminates the need to wait for com plete detailed information before beginning RFI analysis.
- Multichannel wideband radio models include in-band performance, out-of-band spurious and harmonic effects.
- Works with HFSS for wideband antenna coupling or utilizes built-in coupling models.
- Interference effects between RF systems including intermodulation can be modeled 1-to-1 and n-to-1.
- Analysis includes all components: filters, amplifiers, multiplexers, circu lators, isolators, cables, power dividers, etc.
- Integrated standards-based RF system library is provided. Custom libraries can be created and shared.

Link Budget Analysis

- Evaluates wireless system link budgets in the presence of other RF or digital systems to assess the impact of interference on system performance.
- Channel models provide path loss under varying conditions for different wireless services.
- Includes the effects of fading, shadowing, atmospheric and rain attenuation, ground loss and reflections and other factors impacting channel loss.

Diagnostic Tools for Identification and Mitigation of RFI

- Diagnostic tools enable rapid root-cause identification of even the most devious RFI problems with just a click of the mouse.
- Signal traceback graphically shows the exact path of the interference.
- Automatically reports the causes and mechanisms for each interference condition.
- Quickly create RFI mitigation strategies and evaluate their impact on the entire system.
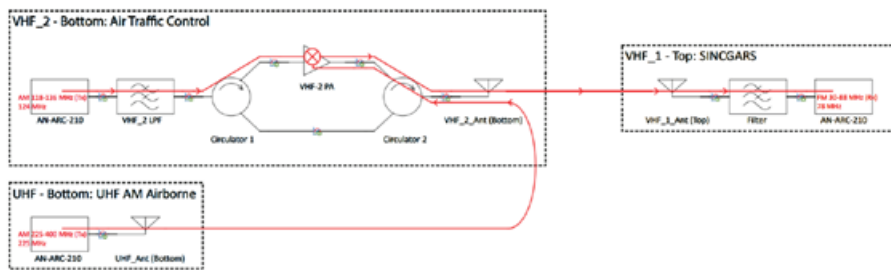
*Interaction diagram in EMIT traces RFI source signal paths.*
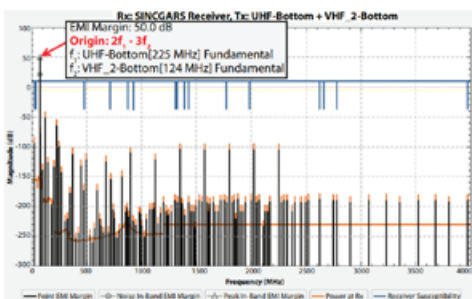
RFI margin plot identifies root-cause indicators.

ANSYS Multiphysics Solutions

help cross-functional engineering organizations predict the performance of complex products influenced by multiple physics and improve their designs through simulations of the interactions between physics.

Simulation of a wireless warehouse
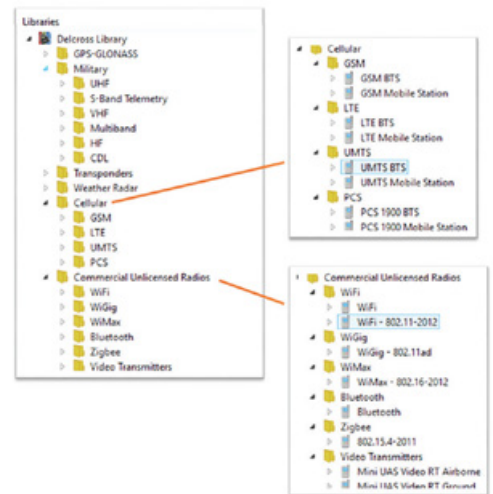
Integrated standards-based model library in EMIT

ANSYS
www.ansys.com
ansysinfo@ansys.com
866.267.9724