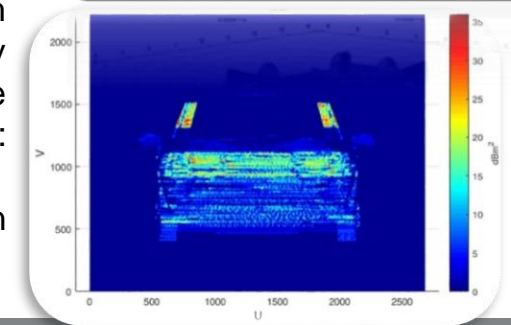
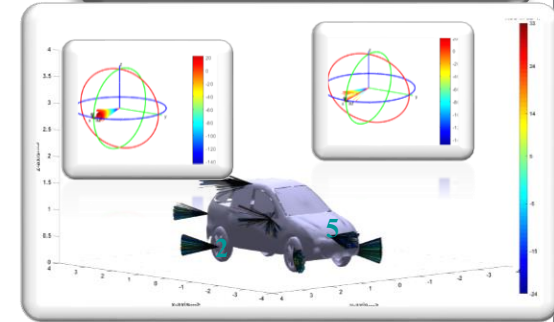
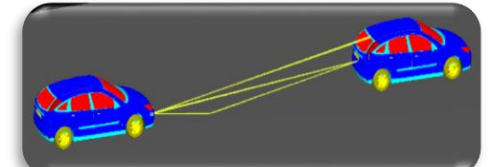


## Deterministic Wave Propagation Simulation based on Ray Tracing / Ray Launching

Radio propagation modeling is a key step in the design of wireless communication systems. In the past decades, several distinguished research and applied works have been done and many useful models and techniques have been developed. In the near future, further development in the radio propagation modeling is expected to achieve intelligent, accurate, and real time application goals.

There are several types of wave propagation models, e.g., statistical, empirical, semi-empirical, deterministic, or EM-based models. EM-based models are according to a detailed simulation of the actual physical wave propagation process. In order to produce a deterministic description of the wave propagation, suitable formulations of the physical propagation phenomena and effects should be applied to a deterministically described scenario. The modeling of the propagation phenomena is usually based on geometrical optics (GO) which is reliable especially at high frequencies. Finding valid paths between sender and receiver can be implemented by ray tracing or ray launching. A variety of ray-tracing or ray launching models can be found in the literature, dedicated for various propagation environments for example: cellular indoor or outdoor environments, tunnels, vehicle-to-vehicle communications. This seminar addresses wave-propagation simulation methods, which are based on Ray Tracing or Ray Launching, through a comprehensive literature review.



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