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**Abstract from QWED**

**Exploring the synergies between electronic material measurements and modeling**

Exploring the synergies between electronic material measurements and modeling

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Electromagnetic simulators have become indispensable design tools for mm-wave communications. However, simulation results can only be as good as material data fed into the simulator, and telecommunication engineers will realize the need for accurate methods of material measurements at GHz frequencies.

It is not so broadly realized that a measurement is not a revelation, but remains subject to similar constraints as a simulation. Behind each measurement, there is a model of the physical processes assumed to be taking place in the material, and the measurement serves to identify that model parameters. Hence, a reliable simulation of the measured scenario is needed to validate the constructed model under a range of conditions.

Despite such bilateral links, the two worlds of material measurements and computer modelling are mostly advanced by separate groups of researchers. In this talk, we report our works within the European H2020 MMAMA project, aiming to bring the two worlds closer together. We focus on the resonant methods of dielectric measurements and present new models (e.g. industrial CAD formats translated into conformal FDTD meshes) and simulation procedures (e.g. near-field-imaging) that support their understanding (of e.g. SPDR and SiPDR techniques) and developments (e.g. downscaling of surface scans). We discuss grid-search workflows that help illustrate sensitivities to material data.