OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

CHAIR OF ELECTROMAGNETIC COMPATIBILITY

MT Comparison of the Random Coupling Model with the Plane Wave Integral Representation #MSC #MS

Background and problem: The field in electrically large and complex shaped resonators (e.g. car bodies, aircraft fuselages, ...) can in principle be described deterministically. Anyhow, such a description is of little value, as a small change in frequency, in th spatial position or in the electromagnetic boundary conditions may lead to a completely different field pattern. Therefore, a statistical field description is much more suitable that can also be experimentally reproduced in reverberation chambers. If a device under test is placed in such a field, also the coupling has to be described statistically. For this, several methods exist, as the *Random Coupling Model* or the *Plane Wave Integral Representation*.

Task: The aim of the project is to solve a given coupling problem with both methods and to compare both procedures (e.g. necessary parameters, computational effort, accuracy, ...). As a coupling problem, the field coupling to a single wire transmissio line above a conducting ground plane shall be analyzed. For this problem, experimental results as well as several analytical and numerical results based on the *Plane Wave Integral Representation* exist at the chair for EMC, so that only a solution via the *Random Coupling Model* has to be found for comparison.

The solution to be analyzed is e.g. the coupled voltage (or current) at one line end as a complex phasor. This phasor can be characterized by its real and imaginary part, its magnitude and phase or its squared magnitude, which is proportional to the pow From these characteristics, the frequency-dependent average, minimum, maximum or standard deviation can be calculated. Als the probability density function, cumulative distribution function or the general statistical moments are of interest.

Supervisor: › Dr.-Ing. Mathias Magdowski (mailto:mathias.magdowski@ovgu.de)

◄ Vorherige Meldung Nächste Meldung ►