**Random Coupling Model for wireless communication systems**

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The Random Coupling Model (RCM) provides a general framework for predicting the statistics of scattering of radiation in complicated enclosures excited either by antennas (S. Hemmady, IEEE T-EMC, 54-4, 2012), or by apertures (G. Gradoni, http://arxiv.org/abs/1303.6526). The RCM is formulated in terms of a random impedance/admittance matrix parameterized by a single scalar parameter, called as the *loss factor*, related to the cavity dissipated power. This approach is relevant to describing the response of mode-stirred reverberation chambers (RCs) with arbitrary loadings, and in presence of energy exchange with the external electromagnetic environment (EME).
In this presentation we discuss how to use the RCM in the modeling of coupled cavities, and a multi-port voltage-to-voltage transfer function is derived. The effect of electrically large apertures opening the cavity is included as an additional contribution *loss factor*. An explicit connection with the transfer function of Multiple-Input Multiple-Output (MIMO) systems operating in indoor EMEs is established. It is shown that the RCM-based transfer function clarifies the role of antennas radiation (polarization, gain, etc.) in creating MIMO channel multivariate distributions.
Furthermore, both the scenario of cavities excited by a radiation coupled thorough an aperture (G. Gradoni, USNC-URSI, Boulder, 2012, and G. Gradoni, EMC Europe 2012, Rome, 2012), and the scenario of interconnected connected RCs (G. Gradoni, USNC-URSI, Boulder, 2013) are tackled in presence of multiple antennas. An experimental validation of the power received by an antenna in a semi-open RC is presented for a rectangular aperture excitation.
Our results are of interest for the emulation of wireless channels in RCs, for the analysis of fading in next generation LTE systems, as well as for the investigation of fundamental properties of mode-stirred enclosures.