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IP Measurement of the Scattering Parameters Between two Helix Antennas in a Reverberation Chamber #MEAS #MSC

Background and problem: The field in reverberation chambers can be described statistically. This description covers the distribution of the field quantities at one position as well as the spatial correlation between nearby field points. Usually, the field a assumed to be *circular*, which means that the real and imaginary parts of the complex phasors of the field components are independent of each other, but follow the same distribution. From this follows that the field is statistically homogenous, isotropic, unpolarized and incoherent. Based on this assumptions, e.g. also the maximum values of the field components and therefore the failure probability of an equipment under test can be determined.

In practice however, the field will always feature a certain *ellipticity*, i.e. a difference between the real and imaginary parts of the complex field components. Measurement are necessary to determine the actual field properties in mode-stirred chambers. Such measurements have only been done with linear polarized antennas up to now.

Task: The aim of this project is to measure the complex scattering parameters between a linear and a circular polarized antenna as well as between two circular polarized antennas. A vector network analyzer is available for this measurement. As linear polarized antennas, different logarithmic-periodic dipole and horn antennas are provided. A helix antenna is available as a circul polarized antenna. A second helix antenna has to be build according to this prototype. The measurement of the scattering parameters has to be done over a wide frequency range for different stirrer positions and has to analyzed statistically.

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