An Introduction to Reverberation Chambers
Theory and Applications

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Abstract: A reverberation chamber is essentially a large "microwave oven" used for testing electronic equipment. Originally, these chambers were developed as rough tools for measuring the electromagnetic emissions *of* microwave ovens. Extensive experimental efforts showed that reverberation chambers could give consistent repeatable results from location to location in a chamber and from chamber to chamber. Unfortunately, limited theoretical support prevented widespread acceptance of these test fixtures. Since the late 1980's, however, the theory of reverberation chambers has expanded to explain earlier experimental results and to predict new results.

Now reverberation chambers are included in several national and international standards, and new applications are being introduced at a rapid pace. Typical applications include EMC (emissions, immunity, shielding), antenna evaluations, wireless (simulating multipath environments, evaluating cell phone characteristics), materials characterization, meta-material antenna evaluation, bioelectromagnetic effects, and more.

This talk will begin with a basic introduction to reverberation chambers…what they are and how they work. We will then present some rudimentary theory, including both electromagnetic and statistical theory. The remainder of the session will be spent discussing new and existing applications, and methods for adapting existing tests and standards for use with reverberation chambers.