Field Uniformity Analysis of Mode-Stirred Chamber by Different Rotating Paddle Structures

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ABSTRACT

In recent years, people are more and more relied on the electrical and electronic devices in daily life. Besides the functional performance is concerned, people also care about if its electromagnetic compatibility characteristic is certified by authority . Several international committee and national authorities have published a variety of the electromagnetic interference and electromagnetic susceptibility standards for the various categories of electrical and electronic equipment and devices used in military, industry, and consumer levels respectively, and require the electrical and electronic products pass the related test to be on the market. As the trend keeps wide-spreading around the world, the request for the EMC test facility is growing day by day. This thesis first briefly introduces electromagnetic wave propagation characteristics and the field uniformity requirement for the test facilities . And we then present the numerical simulations for the rectangular reverberation chamber test site with different stirring paddle shapes. We finally compared it with the IEC61000-4-21 draft and the EN50147-3 field uniformity procedure. A reverberation chamber is an electrically large, highly conductive enclosed cavity with paddle built-in. It is used to conduct electromagnetic measurements for both emissions and immunity tests on electric and electronic equipment. It should be operated with required field uniformity and uncertainty . The shape of paddle and the sampling rate of the E-field distribution are two major issues in this study relating the rectangular reverberation chamber characteristics. By feeding a gaussian pulse to the reverberation chamber, we obtained the E-field distribution and then compared it to the expected field distribution . We thus wish to find the optimization of paddle structure to achieve the “ flat-field ” distribution acceptable to the requirement .

Keywords : reverberation chamber ; EMC ; Anechoic chamber ; field uniformity ; EMI ; IEC 61000-4-3 ; IEC 61000-4-21 ; EN50147-3

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