

A Fast Algorithm for Electromagnetic Compatibility Estimation for Radio Communication Network Equipment in a Complex Electromagnetic Environment

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Abstract : Electromagnetic compatibility (EMC) is the ability of a Radio Communication Equipment (RCE) to operate with a desired quality of service in a given Electromagnetic Environment (EME) and not to create harmful interference with other RCE. This paper presents an algorithm which improves the simulation speed of estimating EMC of RCE in a complex EME, based on a stage by stage frequency-energy criterion of filtering. This algorithm considers different interference types including: Blocking and intermodulation. It consist of the following steps: simplified energy criterion where filtration is based on comparing the free space interference level to the industrial noise, frequency criterion which checks whether the interfering emissions characteristic overlap with the receiver's channels characteristic and lastly the detailed energy criterion where the real channel interference level is compared to the noise level. In each of these stages, some interference cases are filtered out by the relevant criteria. This reduces the total number of dual and different combinations of RCE involved in the tedious detailed energy analysis and thus provides an improved simulation speed.

Keywords : electromagnetic compatibility, electromagnetic environment, simulation of communication network

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