

Electromagnetic Effects on Systems and Components (Invited HPEM Plenary Talk)

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Without a valid and extensive database of effects, which different HPEM systems can cause in electronic systems and components, their design is at least difficult and an optimal result cannot be achieved. The effective range of HPEM systems is another issue which is of great importance and often the difference between an applicable HPEM system and an expensive pile of metal. With the knowledge of optimal (center) frequencies or matched pulse spectra for a given class of electronic systems the susceptibility thresholds of these target systems and their components can be significantly decreased and consequently the effective range of HPEM systems be increased.

In this talk we will give an overview of the published susceptibility thresholds of several types of electronic based systems like computers, computer networks, cars, radar systems, communication devices and many more as well as a deeper look into the disrupting or destructing effects of electromagnetic pulses/fields in electronic components.

The focus of this talk will be on the database of the known susceptibility levels and the characteristics of the applied electromagnetic pulses/fields like field strength, (center) frequency, pulse shape, repetition rate and others. Especially the assessment of the observed effects with respect to the duration and effect on the capabilities of the system is very important and will be part of the presentation.

Additionally the results of some actual susceptibility investigations will be presented exemplary including a discussion of the caused effects. Concluding a short comparison between the effectiveness of different types of HPEM systems like hypo-, meso- or hyperband sources and their calculated maximum effective range against different types of targets will be presented.