COST Action IC 1407

"Advanced Characterisation and Classification of Radiated Emissions in Densely Integrated Technologies (ACCREDIT)"

WG-4: Guidelines for the formulation of standards

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WG-4 description

Cost benefit analysis and a complete set of guidelines will be provided giving the spatial and temporal sampling needed to fully characterise the noisy fields from mixed signal devices such that their performance in any environment can be fully predicted. This should form the basis for the construction of new emission measurement standards that will be of significant value to the industrial community. Care will be taken to make these techniques accessible to end users.

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POTENTIALLY INTERESTING STANDARDS

"Emission standards"

"Immunity"
?

- EN xxx based on CISPR (example CISPR 16)
- IEEE Standards ?
- ……..

Are only basic standards involved or should we move also in generic and/or product standards considering the particular EUTs of our COST action ?

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EMISSION STANDARDS

- ❑ Receiver Spec.
- ❑ Test site spec.

- ❑ Measurement procedures

- ❑ Result evaluation methods
- ❑ Limits

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RECEIVER

- Time domain measurements
  - Comply to CISPR 16 specifications
  - Many papers (Russer et al.) showed the equivalence with FD measurements and that they are faster
- Detectors (are actual Pk, Avg, RMS adequate ?)
- RBWs (are actual CISPR BWs adequate ?)
- Should we propose specific requirements for non-stationary emissions/stochastic signals ?

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MEASUREMENT PROCEDURES

- Dwell time

- Inspection angles
  - TD techniques allow to speed up also angular characterization of the EUT (Russer et al. TEMC 2008)
- Spatial sampling
- Polarizations

- Should we propose specific requirements for non-stationary emissions/stochastic signals ?
- How to manage possible stochastic radiation patterns ?
  (Gradoni et al. New Journal of Physics 2015, Thomas et. al, IEEE 2015))

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Results analysis - Limits

- Should a specific statistical analysis be introduced in case of stochastic sources ?
  - F. Silva et al. (2015) have faced the problem of statistical analysis of pk detector output data

- Should the limits be changed for stochastic sources ? (strictly related to detector choice)

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New standards for measurements ?

- Should we propose a specific standard for NF TD measurements ?
  - Sampling rate
  - Spatial sampling
  - Record length
  - Probe calibration
  - Sensitivity
  - Resolution
  - ……
  - NF-TD set-up as a new test site

- Could it be proposed as an alternative (but correlated) technique for EMC control ? (see the IEC 61967-6 for IC emissions, IEC 62132-9 for IC CW immunity, and IEC 62215-6 for IC transient immunity)

New standards for modelling ?

- Would we like to propose a standard for NF equivalent source modelling ? (see for example IEC 62433-x for IC EMC modelling, proposal)
  - Correlation functions
  - Equivalent dipoles
  - Spherical waves
  - …

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ACTIONS

- Measurement data for comparison
  - Is the collection of emission data from real PCBs feasible ?
  - Round Robin measurements to highlight possible deficiencies in current standards
  - Is there anybody who has already done specific comparisons ? Could available data be shared ?

- Simulation campaign to support the comparison
  - Is the simulation of a FF test useful to discover deficiencies in evaluating emissions from stochastic sources ?
  - Other ?

- Is there anybody already involved in standardization Committees who can propose a specific seminar ?

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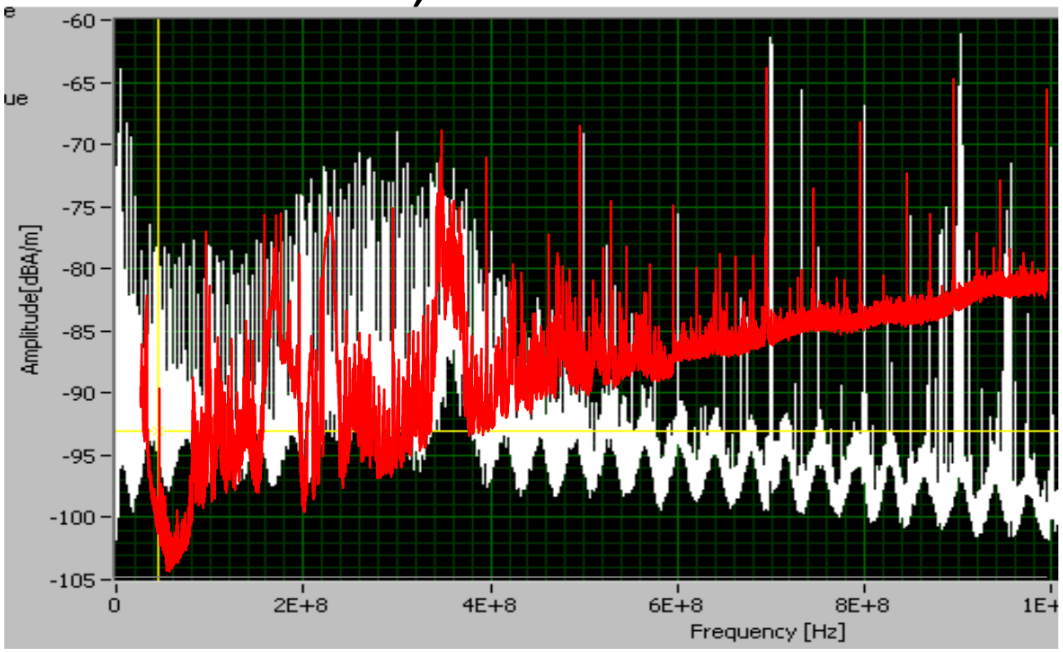
EXAMPLE

White: Nf scan, Red: Semi anechoic



From WS11: “Challenges in near field scanning real world electronic Modules” by Anders P. Mynster, DELTA – Danish electronics, lights and acoustics. EMC Europe – 2015 – DRESDEN.

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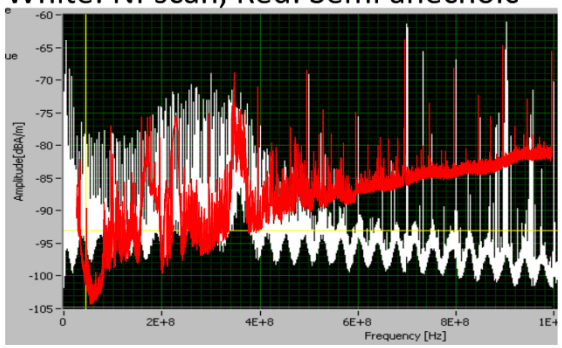

Why below 300 MHz many components are missed by SAC measurements ?

- Was it a problem of the SAC ?
- Was it a spatial or time sampling problem ?
- Was it a problem due to the reactive near field that vanishes in FF ?
  - If so, should it be considered a drawback of the NF techniques ?
  - Or is it a huge advantage aiming at the formulation of NF limits (Xtalk control and limitation in complex PCB assemblies) ?

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DISCUSSION IS OPEN

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