

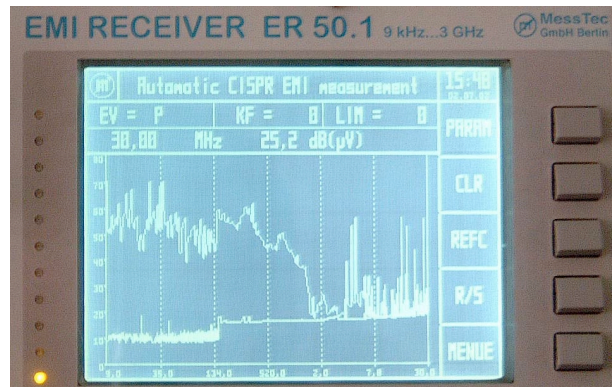
## **Abstract**

# EMC tutorial and applications for physics research

DI Dr. Fritz Szoncsó  
CERN DGS DI

Mobile: +41 76 487 4030  
Office address: CERN/DGS, CH-1211 Geneva 23

E-mail: [friedrich.szoncso@cern.ch](mailto:friedrich.szoncso@cern.ch)  
Home page: <http://szoncso.home.cern.ch>



## **EMC in Physics Research**

Professional EMC and physics research do not sufficiently benefit from each other. For many years the author has tried to establish a scientific relationship between the two domains of research. The talk series to be presented at SoftCOMM Split will, starting with a tutorial on applied EMC in research in general, first establish the necessary bridge between technical or commercial EMC and border line research.

## **Tailored EMC solutions for large scale physics experiments**

Certain types of physics experiments need very specific EMC solutions because of their exotic demands in terms of screening and dynamic range. The problems also encompass consequences of strong magnetic fields, peculiar cabling solutions and design rules ranging from common mode routing to attenuator designs. The talk will have to go beyond classical EMC because physics needs to beyond known limits. As an example you find extremely powerful LASER's that are in need of protecting themselves against auto-interference and the environment against a broad spectrum of pulsed radiation.

## **Exposure of Accelerator Personnel to Non-Ionising Radiation**

Accelerators need strong RF-generators, transmissions lines, cavities and dummy loads. Devices and interconnections are, in case of leak, a hazard for personnel, installations and safety devices. It is shown how fixed installations, test set-ups, factory tests and damages during operation are kept under control such that personnel is not exposed to high power RF-signals. The efforts cover fixed automatic interlock installations, training of personnel and clearly formulated requests to manufacturers in terms of corrosion, thermal expansion, flange tightness over time and guidelines for component exchange.

## **EMC – Examples of mastered problems and avoidable mishaps**

The last part of the talk series will treat the impact of EMC on large scale physics installations. The talk will not only treat a few mishaps where lack of EMC could be singled out as the main culprit. Meant as an eye-opener the talk will show how much EMC positively influences today's designs, how much can be achieved with comparably small investments. Examples of good, well planned and well incorporated EMC design will be shown as the key performer in critical situations.