The Electromagnetic Compatibility Section at ESA ESTEC
The EMC section provides support to all ESA projects, ranging from small experiments to complete spacecraft.

**Science**
- Lisa Pathfinder
- Solar Orbiter
- BepiColombo

**Earth Observation**
- Euclid
- Juice

- Goce
- CryoSat-2
- Swarm
- ADM Aeolus
- EarthCARE
- MTG
- MetOp
- Sentinel series
Project Support (2)

Telecommunication

Alphasat

SmallGEO

Navigation

Galileo

Robotic Exploration

Exomars Rover
Space transportation and Manned spaceflight

ATV

ISS / COLUMBUS

MPCV-ESM

IXV

Launchers

Vega

Ariane5 ECA
The TEC-EEE EMC test facility

Anechoic chamber size [m] 8.55 x 7.5 x 4.75 (l x w x h)
Control room size [m] 3.40 x 6.6 x 2.90 (l x w x h)
Freq. Range [MHz] DC - 25000
Shielding factor at 10GHz [dB] 120
Temperature [deg C] 20 .. 24
Relative Humidity [%] 40 .. 55

The TEC-EEE magnetic coil facility

- two pairs of squared Helmholtz coils for compensation of the local magnetic field (70cm x 70 cm x 70 cm)
- one pair of perm/deperm coils (3 Hz / ~3.5 mT)
- four 3-axis magnetometers and a turntable with motor drive
- Numerical software for magnetic modelling of equivalent (multiple) dipole moments
The EMC section carries out research activities in the following areas:

• Magnetic cleanliness and magnetic measurements
  - Compact low noise magnetic gradiometer
  - Magnetic characterisation by rotational measurement (MCF*)
    or multi-magnetometer snapshot
  - Multiple dipole modelling (MDM) by both deterministic non-linear optimisation**
    and randomised search***
  - Uncertainty analysis and budgeting of Multiple Dipole Models
  - Magnetic cleanliness budget management

• ESD
  - ESD test method for spacecraft equipment
  - Probability of latent failures caused by electro-static discharge

* Mobile Coil Facility, featuring Earth field compensation by Helmholtz coils
** Gauss-Newton, Levenberg–Marquardt
*** PSO = Particle Swarm Optimisation, ES = Evolutionary Strategy
Research Activities (2)

The EMC section carries out research activities in the following areas:

• Simulation and analysis
  - Advanced System Level Radiated Noise Analysis and Simulation for EMC
  - Open source cable models for EMI simulation

• Special test methods
  - Alternative approaches to radiated susceptibility testing at unit level
  - AC magnetic field verification methods
  - RS and antenna RF pattern tests in thermal vacuum chamber
  - Low frequency calibration of EMC current probes and loop antennas

• Not directly EMC related
  - Carbon fiber structure bonding
  - Multi Layer Insulation (MLI) bonding
  - Power Line Communication for Spacecraft (PLC)
  - Biological effects
Would you like to know more?
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