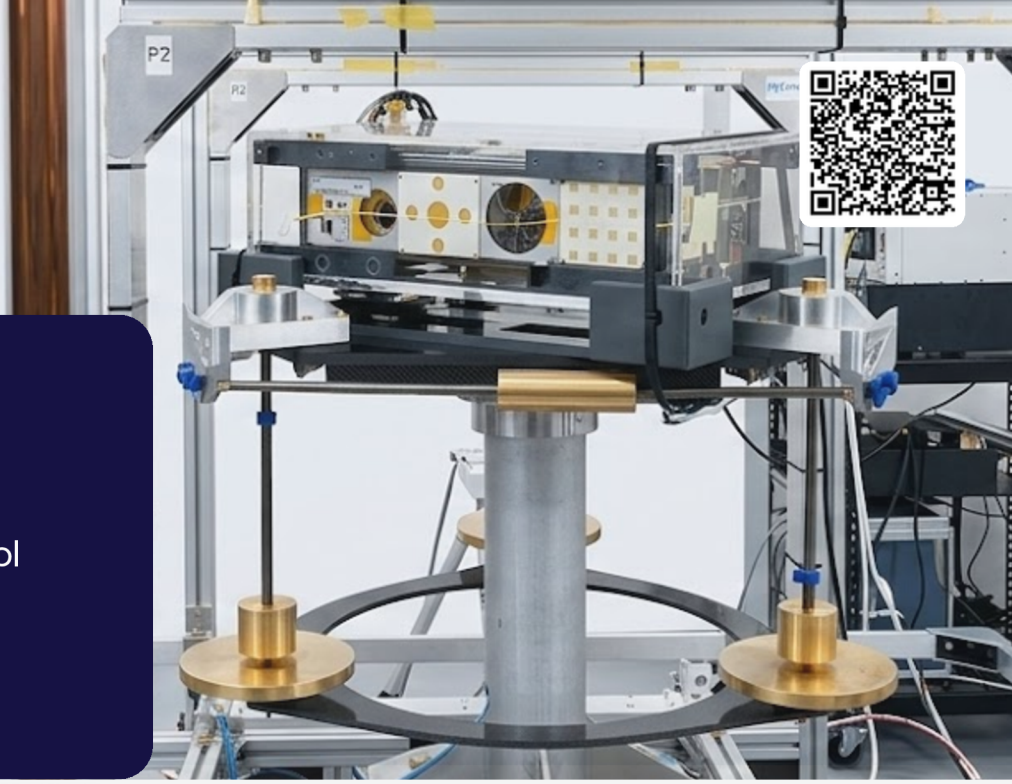
Emtech Space



EOS Facility

Attitude Determination Control System and Magnetics Validation for Small-Sats

Navigating with Certainty

The facility is suitable for magnetic cleanliness tasks like EUT magnetic field measurement, modelling and for nanosat ADCS validation/calibration.

- Accurate Orientation Determination
- Improved stability
- Reliable Satellite Performance in Orbit

Magnetic Modeling & Testing

- **Magnetic Modeling Mechanical** Magnetometer adapters with ArUco tags. 3D printed. Tripod for external magnetometer.
- **Magnetic Modeling DAQ** Base system: 2 DAQs inside and out, fluxgates
- **Magnetic Modeling Software** DC, DC induced, ELF AC and transient modellers
- **Electronics - Coil controllers** all 6 HC coils integrated in one assembly.

Magnetic Perm/De-perm Testing

- At **system** or **unit level**
- **Specialized** retractable coil assembly
- **In house controlling software** with ECSS compliant waveform.
- **Driving electronics**

Simulator Interfacing

- **Interfacing Tools** MATLAB, ODES, SIMSAT, Python, Scilab, or others
- **Data Exchange** via TCP/SSL

ADCS Mode validation
(optional)

- **Air Bearing** On the mission needs
- **Mechanical** Adapter for specific S/C
- **Software**: Comprises sample tests in Python

Sun Sensor Testing
(optional)

- **Includes** Sun simulator lens system and moving platform.
- **Integration** with software simulators

Specifications*

Mechanical

Structure material
Aluminum
X coil dimensions
1.85 m × 1.84 m
Y coil dimensions
1.81 m × 1.81 m
Z coil dimensions
1.77 m × 1.77 m

Coil Elements

Maximum field in any direction
+-200μT
1% maximum field variation within
43 cm × 43 cm × 43 cm
Field accurate within
<250nT
Orthogonality
<1 ◦
Features
Each coil has own controller, driven separately.
Ability to create field gradients in any direction.
Up to 20Hz AC generation for static tumbling scenarios or induced field studies.
Optional features
Radially distributed magnetometers, respective EMTECH DAQs.
Automated magnetometer position and orientation estimation.
On-orbit field simulation.

Missions' Validation

Facility Main Elements

Coil Control Unit

6x EMTECH Current Control Units:
No PWM noise, higher current control resolution (based on linear current amplifiers, ~4.5nT for in series and

~10nT for individual coil driving).
+-150μT range for each axis (in series) or
+-300μTrange for each axis
(6 coils driven separately).

- **Socket interface with PC**, wrapper for integration to various workflows, interfaces with FES simulator, HiL simulations and various orbit scenarios and real time monitoring of field at the center.
- **Integrated EMTECH Magnus AD** DAQs (DC fluxgate versions, filtered) to monitor fields inside the facility and acquire measurements for modelling in single or analog gradiometer mode.
- **Deperm system:** Separate DAC and dual channel high power amp. Predefined deperming waveforms according to ECSS.

*Contents are subject to change without prior notice.

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