Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers

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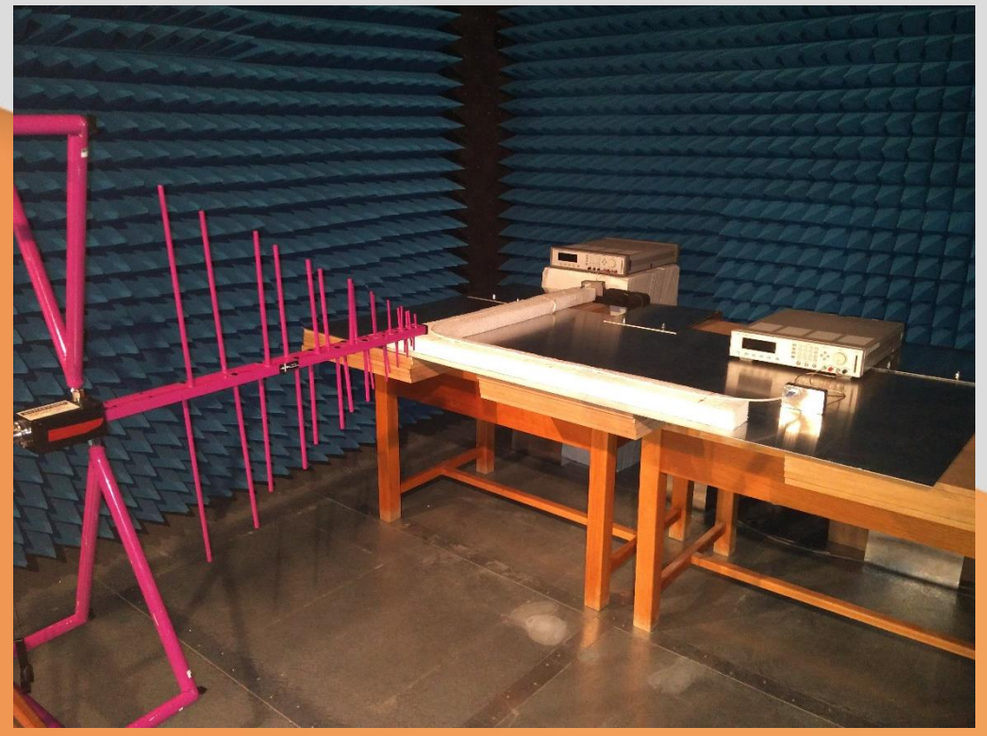
Research Project Title:

Modeling electromagnetic emissions of space equipment for EMC and cleanliness purposes

Principal Investigator:

Christos D. Nikolopoulos



Popular Title:

Modeling Electromagnetic Emissions of Space Equipment

Scientific Field:

Engineering Sciences,Technological Sciences

Host Institution:

National Technical University

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This technical activity outlines the research prerequisites, as well as the technical approach for the definition and development of credible Modelling Methods for Electro-Magnetic Compatibility and Cleanliness purposes, of space mission critical equipment. The target of these modelling methods is to identify potential electromagnetic cleanliness and compatibility problems of the spacecraft harnesses and equipment in the early design stages, and guide the mission definition and later design phases.

As the payload of every scientific mission consists of a large number of different instruments to measure electromagnetic fields and particle populations in space plasma, these instruments are necessarily sensitive to magnetic and electric fields that are produced by the spacecraft's onboard equipment, units as well as harnesses. This implies stringent electromagnetic cleanliness requirements.

Although the heritage knowledge and experience from previous missions is limited, the appropriate methodology to be applied is to select critical platform equipment (Equipment under Test - EUT), to characterize them using specific test procedures and finally, to perform simulations to analyze the electromagnetic behavior of the equipment and define corresponding electromagnetic models.

In the framework of this project measurement equipment shall be acquired, and complementary developed and built, capable of evaluating emissions of space-based devices and verifying their respective models. One of the ambitions of the research team is that the equipment will be capable to gather measurements on par with major European companies (Thales Alenia Space, Airbus, etc.) and research centers (ESA, etc.) abroad, which are not currently available in Greece.

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Project Impact on Society

The implementation of this project is expected to have a significant impact on society as it enables the presence of new highly qualified researchers in Greece, in contrast to the brain drain due to the economic crisis. An important contribution will be to acquire, maintain and disseminate the know-how of space-based measurements in a university environment, and to offer undergraduate students the opportunity to participate in an electromagnetic emission measurement campaign.

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To me, H.F.R.I. funding would mean...

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This activity introduces, for the first time in Greek university, the concept of a research fellow as established in most foreign universities. The university provides this independent researcher, without himself forming part of the teaching staff, with the means to carry out his basic or applied research. I think that if this action is properly implemented, it can be a springboard for changes in higher education and staff university institutions with new scientists separating the academic faculty from researchers.

The Principal Investigator,
Christos D. Nikolopoulos

Funding

Amount: **178,628 €**

Duration: **24 months**

Foundation: **H.F.R.I.**

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