

## Proposta de dissertação de Mestrado

Período de Execução		
2013/2014 or 2014/2015		
Cursos		
Engenharia Física Tecnológica - IST		
Número da Proposta		
162		
Título		
A Particle Detector for the ESA mission to the Jupiter Icy Moons		
Orientador		
Técnico Lisboa Username	Nome	% Créditos
ist24591	Patrícia Carla Serrano Gonçalves	100
Coorientador Externo		
Nome		
Email		
Telefone		
Nome da empresa		
Morada da empresa		
Enquadramento (Indicar adicionalmente Ramo/Área de Especialidade caso aplicável)		
Physics, Radiation Physics, Radiation effects, Space Applications. Study of the planetary radiation environment. Case study of the JUICE mission to the Jovian system.		
Objectivos		
Characterize the response of RADEM, the Radiation Hard Electron Monitor, for JUICE, when subject to the Jovian system radiation environment under different spaceweather conditions.		
Descrição		
<p>The Jovian system is known to be outstandingly complex with its extremely hazardous and highly dynamic radiation environment. Therefore, its rigorous, accurate exploration, as well as profound understanding is enormously valuable for answering questions on planet formation and emergence of life. One of the biggest challenges for the ESA JUICE mission, is to measure and handle the compound, intense and highly penetrating radiation environment of Jupiter and its active moons. Based on previous data, it has been long understood that Jupiter radiation field plays a decisive role in radiation damage scenarios for the whole spacecraft and all its payloads. Due to its excessive features such as very high fluxes and wide range of energies, it also drives detection principles for science instruments and in particular for radiation monitors. In this context, a comprehensive, reliable and accurate monitoring of the radiation onboard of the JUICE mission is a major challenge and a high priority task. It is crucial for safe operation and continuity of the mission, as well as for the scientific data analysis support. RADEM, the Radiation Hard Electron Monitor, for JUICE, is based on a design concept for which a first prototype already exists. It is being developed by an international consortium which will further optimise the existing concept, which will be tested during 2014 and 2015. In this work the different radiation environment models that exist for the Jovian system will be used to study the response of RADEM under the radiation environment expected at the different locations of the JUICE mission orbit and under different spaceweather conditions.</p>		
Requisitos (e.g. média, disciplinas concluídas)		
The work will have a strong component of radiation interaction simulations with matter. C or C++ programming skills are desirable. Interview required.		
Resultado esperado		
A successful thesis, contributing for detector design optimisation. Publication of results in an international journal.		
URL da descrição detalhada da dissertação		
<a href="http://www.lip.pt/~space">www.lip.pt/~space</a>		
Observações		
Localização da realização da dissertação		
LIP		

**Contact: Patrícia Gonçalves, [patricia@lip.pt](mailto:patricia@lip.pt)**