Training Opportunity for Portuguese Trainees

Reference	Title	Duty Station
PT-2017-TEC-MME	**Optoelectronics**	**ESTEC**

Overview of the unit's mission:

Mechatronics is the fusion of mechanical, electrical, optical and optoelectronic/electro-optic, material and bio-technology systems. It contributes to the development of advanced robotics, of instrumentation for physical or life sciences, of optical instruments for remote sensing, of devices which transmit and detect light for communication or processing, as well as for the development of life support systems. The design and verification of optical systems is another core activity, ranging from full-sized telescopes to fibre optics and photonics devices, from laser communications to LIDAR atmosphere-sampling sensors and space interferometers. This work extends into advanced and highly coherent lasers and LIDARS and other optoelectronic devices such as detectors and spectrometers. Techniques to generate large numbers of cold atoms using simplified experimental methods have also been developed in the recent past adding to the range of techniques needed to be qualified for later space implementation. The applications are principally in the domain of laser cooled atom sensors including Cold Atom Interferometry (CAI), Optical Atomic Frequency Standards (OAFS) as well as the transfer of ultra-stable frequencies in fibre networks and eventually in free space.

Overview of the field of activity proposed:

In order to support future SmallSat payloads, a detailed modelling tool is being developed. The activity proposed here will be a continuation of this effort to provide the final end to end modelling environment. Consequently it will provide a unique opportunity to obtain payload and space systems engineering experience. The candidate will be given the opportunity to contribute ideas at an early stage of development, possibly into a quantum technology element.

Main Tasks

- Optoelectronic Payload modelling work in TEC-MME: At detailed functional and thermal level using COMSOL
- Integrate defined model elements into an end to end modelling system using MAPLE SIM
- Provide instrument model verification of the software model by experimental data; performance verification following vibration, shock, radiation and thermal Vacuum
- Extend the model to encapsulate special platform conditions such as drag-free control
- Evaluate the inclusion of a Quantum Payload as a novel future payload

Required education:

Applicants should have just completed, or be in their final year of a University course at Masters Level (or equivalent) in a technical, scientific or ICT discipline, with a significant component related to one or more of optoelectronics, detectors (CCD, CIS), big data analysis, informatics, instrumentation, etc.
Hands-on experience with electronics, optics or good programming skills in Python is a strong plus.
Applicants should have good interpersonal and communication skills and should be able to work in a multi-cultural environment, both independently and as part of a team.
Applicants must be fluent in English and/or French, the working languages of the Agency. A good proficiency in English is required.