

## Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2010-TEC-ETN(3)	On board Integrity Monitoring techniques	ESTEC
<p><b><u>Overview of the Division missions:</u></b>            The RF Payload Systems Division is responsible for space instrumentation and communication systems, subsystems, equipment and technologies. This covers:</p> <ul style="list-style-type: none"> <li>• Communication systems and subsystems design and validation;</li> <li>• Radio Navigation systems, subsystems and equipment (GPS, EGNOS, GALILEO);</li> <li>• Systems for TT&amp;C communication, remote sensing and scientific applications;</li> <li>• Satellite payloads (e.g. repeaters for telecommunications or navigation instruments for earth remote sensing or scientific applications)</li> <li>• Microwave and millimetre wave equipment and technologies;</li> <li>• Complex on-board payloads for communications and remote sensing, and processing core of such systems, including optically based implementations;</li> <li>• Systems testing for performance evaluation or validation.</li> </ul> <p>The expertise of the Division is essentially used for :</p> <ul style="list-style-type: none"> <li>• Preparation and implementation of various ESA R&amp;D programmes</li> <li>• Support to ESA projects</li> <li>• Consultancy to customers outside ESA</li> <li>• Training and supervision of students, graduates, research fellows</li> <li>• European Standardisation of technologies</li> <li>• Organization of workshops and conferences</li> </ul> <p>The trainee will be integrated into the Radio Navigation Systems and Techniques Section. The section is involved in:</p> <ul style="list-style-type: none"> <li>• Radio navigation systems studies</li> <li>• Support to the EGNOS and Galileo projects for system design, development and testing</li> <li>• Advanced research and development in the field of radio navigation techniques and technologies</li> <li>• Development of receivers for GPS, EGNOS and Galileo</li> </ul>		
<p><b><u>Overview of the field of activity proposed:</u></b></p> <p><b>On board Integrity Monitoring techniques development prototyping and testing.</b></p> <p>The possibility to monitor integrity feared events (e.g. clock, Signal) directly from the Spacecraft is seen as a very attractive opportunity in order to reduce the complexity and the operational costs of the GALILEO Ground Monitoring Network.</p> <p>In order to do this advanced SIS processing techniques for dedicated On Board Monitoring Unit are being developed to detect effects directly from the sample of the Navigation Signal immediately prior to its injection in the broadcasting antenna. Trade off between complexity and accuracy and analysis of the performance of the algorithm is part of the work to be done before concluding on the implementation.</p> <p>The trainee will work in the following areas:</p> <ul style="list-style-type: none"> <li>• Analysis and development of algorithm for on board integrity monitoring</li> <li>• Prototyping of critical functionalities in Matlab and C/C++</li> <li>• Lab testing of prototyped functionalities in the European Navigation Lab at ESTEC</li> </ul>		
<p><b><u>Required Education:</u></b></p> <p>Degree in Telecommunications Engineering or similar            C/C++ and Matlab programming ability            Previous contact with a radiofrequency lab would be desirable            Previous knowledge of radionavigation would be desirable            Background in Signal processing would be desirable</p>		