

Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2010-TEC-ETM(1)	Power amplification, telecommunications	ESTEC
<p><u>Overview of the Division missions:</u> The RF Payload Systems Division is responsible for space instrumentation and communication systems, subsystems, equipment and technologies which cover the following domains:</p> <ul style="list-style-type: none"> - Communication systems and subsystems design and validation; - Systems for TT&C communication, navigation, remote sensing and scientific applications; - Satellite payloads (e.g. repeaters for telecommunications or navigation instruments, earth remote sensing instruments for scientific applications); - Microwave and millimetre wave equipment and technologies; - Complex on-board payloads for communications and remote sensing, and processing core of such systems, including optically based implementations; - Systems testing for performance evaluation or validation; - Laboratories to test/proof concepts soundness and validation. 		
<p><u>Overview of the field of activity proposed:</u></p> <p>In interactive broadband satellite communications systems, smaller antenna beams allow supporting increased throughput and higher data rates but imply higher load and beam variability in space and time. A flexible allocation of bandwidth and power to beams would allow serving the hot spots without resulting in wasted capacity/power/bandwidth in the cold spots.</p> <p>Flexible Travelling Wave Tubes (Flex-TWTAs) are bias-adjustable high power amplifiers, whose saturation power can be adjusted within a range of 3-4dB, while maintaining an almost-constant DC-RF conversion efficiency.</p> <p>Flex-TWTAs can be used in conventional/non-flexible telecommunication payloads to help coping with the variation of traffic pattern distribution during the long satellite lifetime: their operating point will typically be (pre)defined, but an apposite telecommand will allow adjusting it to the specific traffic distribution. The maximum exploitation of the capabilities of Flexible Tubes will however take place in flexible payloads where the operating point of the amplifiers will have to be adjusted "real time" in power and bandwidth to respond to traffic variations.</p> <p>A repetitive and prolonged variation of the operating point might cause some problems in the TWTA with a consequent switch-off of the tube. So far, the characterisation of Flex-TWTAs has not been performed against the operating point variation according to a realistic mission profile.</p> <p>The objective of the activity proposed is to set-up an automatic test bench and characterise the behaviour of a flexible TWTA when submitted to a realistic flexible payload mission profile. The tests will be performed on available, state-of-the-art Flex-TWTAs in Ku- and/or Ka-band. This will allow validating the design of state-of-the-art Flex-TWTAs and their reliability against the required flexibility in power and bandwidth.</p>		
<p><u>Required Education:</u> MS or BS degree in Telecommunications/Electrical/Microwave Engineering. Good knowledge of RF and microwave systems is required as well as some experience in RF test of microwave equipments. Experience in computer programming and MATLAB is also required. Background knowledge on satellite telecommunications techniques & systems and familiarity with Travelling Wave Tube Amplifiers is an asset.</p>		