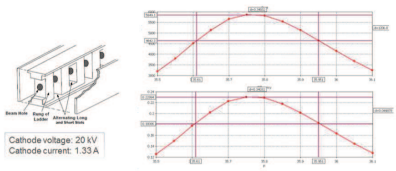
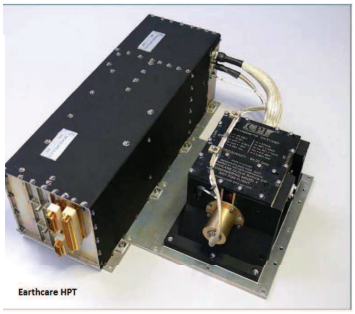
Activity Title:	***Feasibility study on pulsed HPA for Ka-band SAR instruments***		
Contract type	**TRP**	**Budget** *(k€)*	**150**
Company (-ies) *(including country)*	Selex ES (Italy) AURORASAT (E)		
Team *(name of the participants in the project)*	Marcello Gambarara (Selex ES), Alberto Battisti (Selex ES), Roberto Dionisio (Selex ES), Paolo Galantini (Selex ES), Rosario Martorana (Selex ES), Aurelio Borella (Selex ES), Carlos Vicente (AURORASAT), Carlos Gahete (AURORASAT)		
(*) **Speaker (s)**	Rosario Martorana	**Email**	rosario.martorana@finmeccanica.com
Short Speaker Information *(experience and involvement in this project – maximum 60 words)*	Rosario Martorana. In 1986 obtained the Laurea in Ingegneria Elettronica from Università degli Studi di Palermo.In 1987 joined R & D team of Finmeccanica Palermo plant (at the time Selenia) as microwave tube designer: involved in the development of a gyrotron 8 GHz 500 KW jointly with Varian Palo Alto California. Has been Microwave tube design engineer and project leader of many development from S toKu band and different types of valves for different applications (naval, airborne, missile): klystron, magnetron, helix TWT. Is currently the head of Engineering TWT team in Palermo.		
Summary of the activity *(maximum 400 words and 2 pictures)*	The Synthetic Aperture Radar (SAR) are essential instruments for Earth Observation. Use of Ka-band SAR instruments imaging has been proven in various airborne demonstrators and instruments but, so far, it has not been utilized for SAR from space. The need of a Ka-band High Power Amplifier (HPA) with capabilities beyond what is currently available on the market has been pointed out by an ESA internal study on the feasibility of a Ka-band SAR instrument and interferometer. The key issue relevant to the Ka-band SAR is the availability of a vacuum tube amplifier given the high output power required. Main characteristic and design driving requirements of the HPA in subject are: • Carrier frequency: 35.75 GHz • Transmitted Peak Power: 3.5 kW (4 kW goal) • Operating bandwidth: 350 MHz minimum. • Duty cycle: 13% The feasibility study has been focused on the definition of a possible solution, starting from the available vacuum tubes technologies and defining the required development plan to achieve a space qualification for the identified one. From a review of the existing devices for both space, avionic and ground application, it resulted that there is not a technological limit in the vacuum tube technology to achieve the required performances in terms of peak power and bandwidth. Nevertheless the development of a new vacuum tube is needed in order to get a space power device and to achieve the challenging performances required for the Ka-band SAR. Moreover, since no European product is available to the purpose, either space or avionic/ground, export restrictions can be an issue, thus the opportunity to develop an European device for such application has been looked at as a further objective. Starting from the driving requirements, a trade-off between the TWT and the EIK was carried out resulting in the baseline where the preferred technology is the klystron one. All aspects related to the application, like the multipaction, the extended lifetime both in terms of operative hours and switching cycles and thermal control issues have been investigated to achieve a design baseline that will be the starting point for the following development. An updated technical requirement specification has been issued and a detailed development plan has been proposed to achieve the space qualification of the baseline HPA.  		

(*) The speaker needs to do the registration through this website