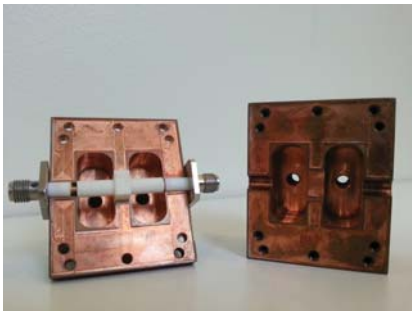
Activity Title:	***Development of 3D Filters made by 3D ceramic stereolithography***		
Contract type	**NPI**	**Budget** *(k€)*	**90**
Company (-ies) *(including country)*	Xlim UMR 7252 CNRS/University of Limoges		
Team *(name of the participants in the project)*	Yoann Marchives, Xlim research institute, University of Limoges, France Nicolas Delhote, Xlim research institute, University of Limoges, France Petronilo Martin Iglesias, ESA/ESTEC		
(*) **Speaker (s)**	Yoann Marchives, Nicolas Delhote	**Email**	nicolas.delhote@xlim.fr
Short Speaker Information *(experience and involvement in this project – maximum 60 words)*	Yoann Marchives is actually working towards his PhD under the supervision of Dr Nicolas Delhote. They are both involved in the development of new solutions for IMUX filters using ceramic materials and additive manufacturing. Low loss and/or high k ceramics are here specifically shaped to provide new 3D and compact solutions for satellite applications.		
Summary of the activity *(maximum 400 words and 2 pictures)*	The objective of this NPI activity is to explore dielectric filters using original 3D shapes. Additive manufacturing is one of the technologies used here for this purpose with a particular objective of creating filters with a limited number of parts. Ceramic filter are more specifically studied here in order to obtain compact and very wide bandpass filters. The creation of very high coupling values between dielectric resonators is particularly difficult and a specific configuration based on the stacking of TM010 mode resonators has been proposed. That approach allows the creation of very wide bandpass filter (> 10%) while keeping a rather good spurious free range and limited insertion loss. The proposed shape is very compact and can be built within just one part. Specific coaxial probes have been designed in order to provide the very high input and output coupling needed by such structure. 2nd and 4th order bandpass filters have been designed around 4 GHz and manufactured out of Zirconia (ZrO2) by additive manufacturing and high accuracy machining. 		

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