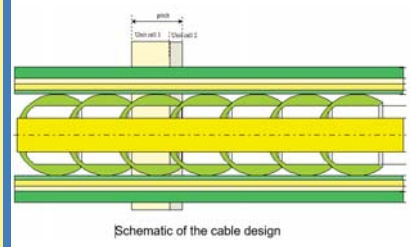
Activity Title:	***Lightweight RF Power Cables with High Phase Stability***		
Contract type	**ARTES 5.1**	**Budget** *(k€)*	**500**
Company (-ies) *(including country)*	HUBER+SUHNER AG (Switzerland) LEMA/EPFL (Switzerland) IMES/ETHZ (Switzerland)		
Team *(name of the participants in the project)*	Michael Mattes, LEMA/EPFL Eden Sorolla, LEMA/EPFL Gerald Kress, IMES/ETHZ Ioannis Koufogiannis, HUBER+SUHNER (ex LEMA/EPFL)		
(*) **Speaker (s)**	Holger Karstensen	**Email**	info@karstensen.biz
Short Speaker Information *(experience and involvement in this project – maximum 60 words)*	Dr. Holger Karstensen is currently Technical Program Manager at HUBER+SUHNER AG, Herisau, Switzerland. His activities include power management in coaxial cables, connectors and antennas, PIM and phase optimization of components, High Power Limiters, and strategic technology management in general. He is project leader of the activity “Lightweight High Power Cables with High Phase Stability”.		
Summary of the activity *(maximum 400 words and 2 pictures)*	This activity focused on the development of ultra-light RF cables capable to handle RF power signals as considered for future telecom payloads. State of the art RF power cables have a serious limitation imposed by the poor thermal conductance from the inner conductor to the outside of the cable. This also implies poor phase stability which is an important requirement when combining amplifiers in reconfigurable or extremely high power payloads. Considering the use of MPA, it is expected a large number of cable assemblies which implies a significant mass. Therefore, it was one of the major goals of this activity to reduce the mass of the cables in the order of 30-40% and also to meet more stringent requirements on phase stability as compared to currently available cables. The remaining RF parameters should not significantly be degraded. Modelling tools were necessary for the prediction of the thermal, mechanical and RF performance of the cable assembly. Qualification models of the cable assembly have been designed, manufactured and tested. The most challenging goal was to create suitable models for the phase stability behaviour of a cable, especially the extremely important dependence of the relative permittivity of the dielectric material on temperature and (temperature induced) mechanical stresses that occur in the cables, an effect that has been mostly neglected in previous studies. Samples had to be fabricated to prove the validity of the models, and suitable materials had to be found for the final design of the phase-stable cable. A variety of engineering cable samples with different material combinations and various cable assembly concepts had been fabricated and characterised, until a cable design fulfilled the phase-stability requirements. All parameters of the phase stable cable are within or better than the specified values. The final cable mass is extremely low (48 g/m) and the very stringent requirements on phase stability (<500ppm in the temperature range -55 and +125°C and <1000ppm between -55°C and 165°C) could be achieved after a variety of design and material changes.  Schematic of the cable design Click here to add a picture		

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