

<u>Name</u>	<u>Organisation</u>	<u>Project title</u>	<u>Decision No.</u>	<u>Decision date</u>	<u>Funding period</u>	<u>Funding</u>
Rahkonen, Timo	OY	Linearity enhancing of RF Power Amplifiers (RFPALin)	132145	29.09.2009	01.01.2010 - 31.12.2013	355 000

Project description

Nonlinear effects in RF power amplifiers (PAs) are not yet well understood, and this tends to result in overkill in the PA design and linearization techniques. This research uses a recently developed distortion analysis method called Volterra-on-Harmonic Balance (VoHB) for obtaining fundamental understanding of chosen transmitter structures, and developing physically motivated and verified rules for designing transmitters, where inherent distortion and memory effect cancelling mechanisms are employed. The project has three main parts: a) detailed distortion analysis of chosen transmitter structures (Doherty PA, envelope tracking, and polar transmitter), resulting in usable design procedures, b) study of some less known amplifier (especially switching amplifier) properties and developing corresponding design techniques and tools, and c) verifying these findings in practice. The main outcomes of this project are verified and documented analysis results and design techniques for RF transmitters and PAs, and improvements in analysis tools used. The former results in lower power RF transmitter, the latter in more reliable design procedures. As a more general, but perhaps even more important result, the general ability to understand the nonlinear effects in analog circuits is largely improved.