

Project abstract

Title: Digital Receivers that are Extremely Wideband (DREW)

Objective

To design and demonstrate fully integrated extremely wideband digital receivers that will pave the way for future electronic warfare as well as mobile network products.

Abstract

Saab and Ericsson develop advanced electronic systems, Saab for defense and security and Ericsson for mobile communications (5G). Electronic Warfare (EW) systems from Saab are based on advanced wideband microwave technology, currently using modules with discrete components. The systems from Ericsson have higher integration level, but there is a need to increase the bandwidth. Both companies would benefit from solutions combining wide bandwidth and high integration level, which would reduce production costs and increase flexibility. For example, many frequency bands could be handled by a single circuit in a base-station. Weight, size and power consumption would also be reduced, important for cost and a necessity in airborne applications. A higher level of integration is also needed to deal with the rapidly increasing complexity of the systems. The project will thus develop wideband digital receivers, fully integrated in advanced CMOS technology. The circuits will feature both radio frequency parts and AD-converters, and will be demonstrated together with wideband antennas. The circuit design group at Lund University has a long experience in designing radio frequency circuits and AD-converters in semiconductor technologies suitable for high integration. The group has hosted two Vinnova centers in integrated circuit design (CCCD, 1997-2006, and SoS, 2008-2017) and many circuits with world-class performance have been presented over the years. Combined with the unique competence at Saab and Ericsson, this enables an ambitious goal, i.e. to design and demonstrate circuits paving the way for future products with digital wideband receivers.

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Total cost of project: 5 736 000 kronor

Total grant: 2 500 000 kronor