



IC1301 - WiPE

Wireless Power Transmission for Sustainable Electronics

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EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

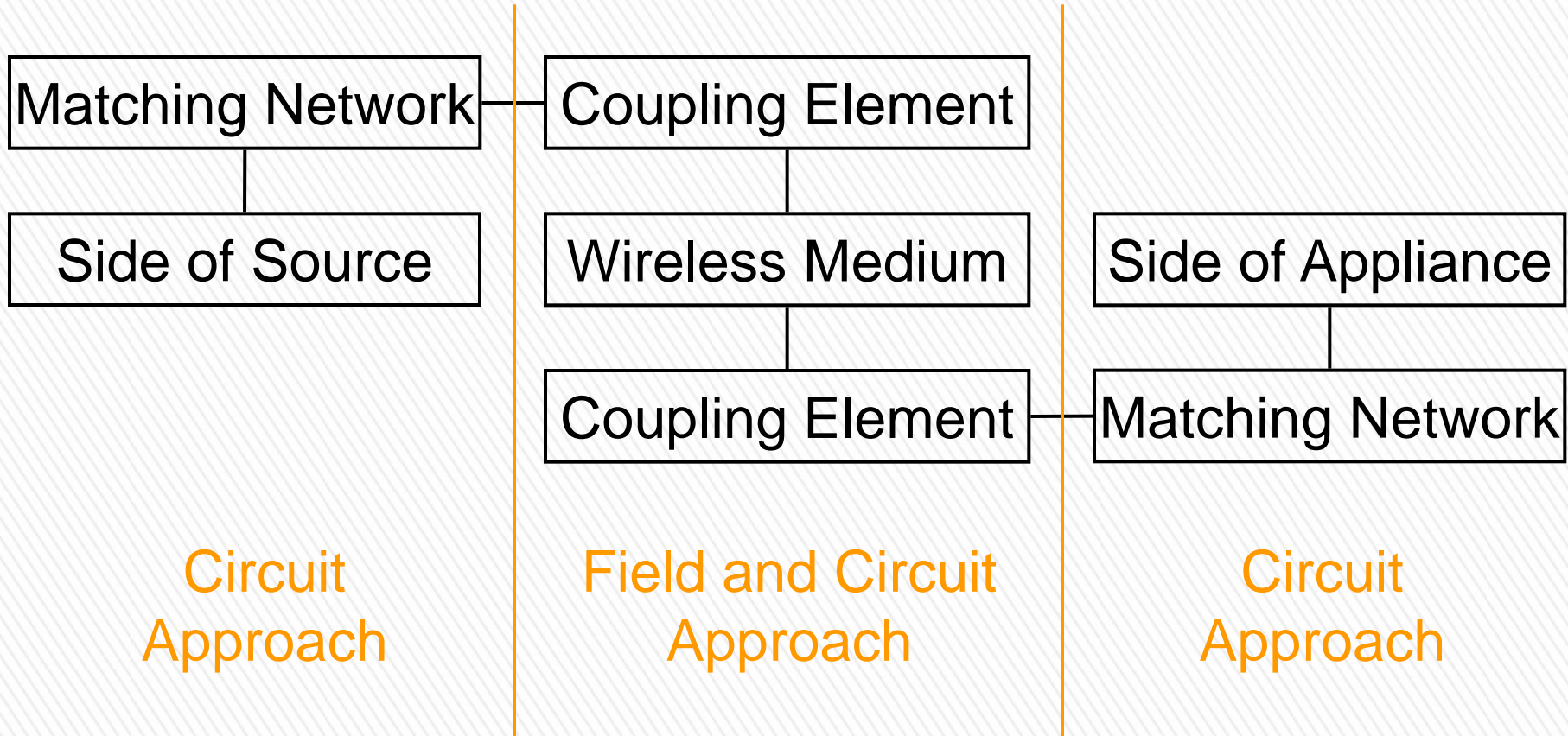


Participating Institutions

- » Aalborg University
- » Acorde Technologies, S.A.
- » CNRS LAAS & University of Toulouse
- » Continental Automotive France SAS
- » Czech Technical University in Prague
- » Heriot-Watt University
- » Imperial College London
- » INESC TEC
- » KU Leuven
- » "Sts Cyril and Methodius" University
- » Universidade de Aveiro
- » Universite de Mons
- » University College Dublin
- » University of Bologna
- » University of Nicosia
- » University of Nis
- » University of Perugia



Standard Model



What are necessary parameters for description of each block?



Scientific Program

1. Modeling of circuits and structures of IWPT link

- » Characterization of a IWPT link
- » Development of new architectures of high efficiency RF PAs, HF/DC or DC/DC converters, and rectifiers
- » Design of signals for efficient IWPT
- » Analysis of electromagnetic field used by induction coils and extraction of circuit parameters for simplified circuit model
- » Investigation of power losses of transmission



Scientific Program

2. Optimization of the circuits and structures of IWPT link towards higher transmission efficiency
 - » The results of aim 1 can be used for optimization of coupling performance for different scenarios, i.e. tight close range defined transfer or free space random transfer.
 - » The goal is to choose proper signal and frequency band, architecture of circuits and coils geometry.

Scientific Program

3. Development of rules for design of circuits and structures of IWPT link

- » The generalization of result of the previous aims is planned to be used for finding of recommendations for design of the IPWT link.
- » Development of nonlinear design tools for the broadband optimization of entire IWPT link at all the possible link distances and loading conditions is considered.



Expertise Covered

- » Nonlinear modeling of circuits
- » High efficiency RF PAs, HF/DC or DC/DC converters, synchronous rectifiers for wireless powering
- » Analytical/numerical modeling of electromagnetic structures
- » Optimization
- » Electromagnetic compatibility



Potential Applications

- » Chargers of mobile utensils
- » Implantable devices
- » Wireless sensor networks, autonomous sensor
- » Multifunction circuits
- » Green electronics



Challenging Problems

- » Useful concepts
- » General theory
- » Intelligence and adaptability of system
- » Low power and nonlinearity
- » Wideband transmission and electromagnetic compatibility and safety levels



Discussion