



WP 1 - Antenna Expert Groups

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WP 1 – Antenna Expert Groups



Antenna Expert Groups (AEGs) assure availability of the major antenna fields:

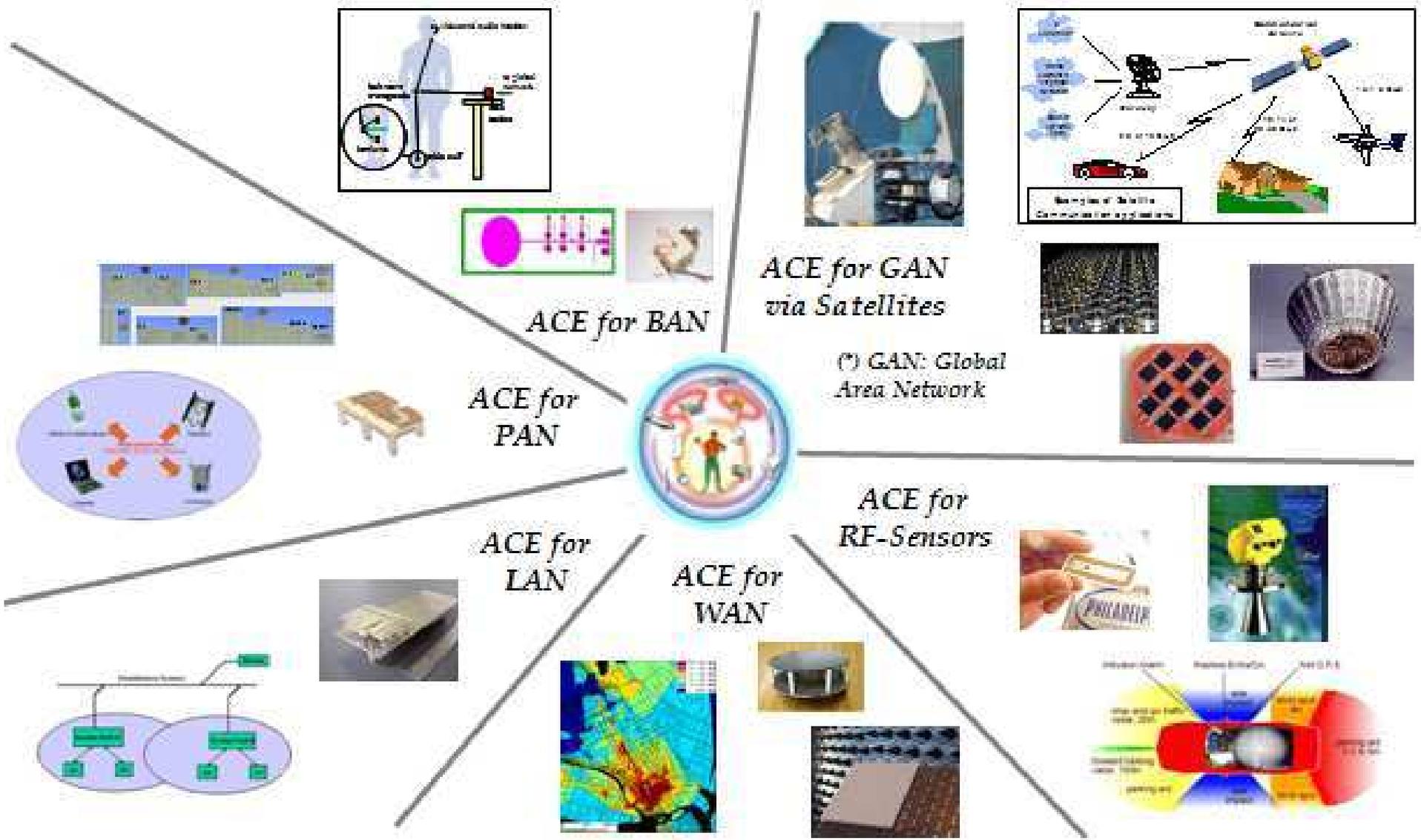
AEG1 – Millimetre and Submillimetre Wave (coordinator UR1)

AEG2 – Small Antennas and Sensors (coordinator IMST)

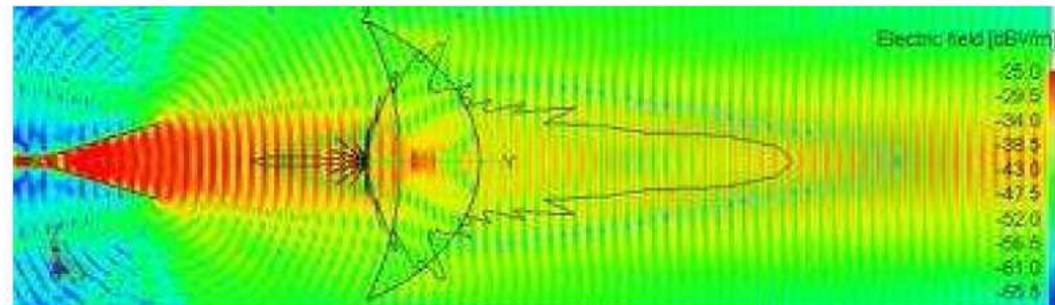
AEG3 - Wideband Antennas (coordinator KIT)

AEG4 – Array Antenna (coordinator UPM)

AEG5 – Smart antenna (coordinator UPM)

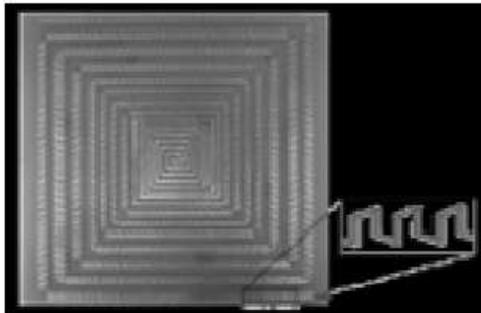


AEG1 – Millimetre and Submillimetre Wave (coordinator UR1)



Fabry-Perot resonator with lens antennas model and testing (CTU)

AEG2 – Small Antennas and Sensors (coordinator IMST)



Antenna for RFID applications (IMST)

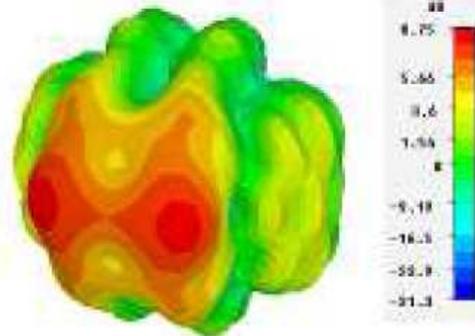


Folded monopole 2.4 GHz antenna closely spaced over PEC thickness $d/\lambda \sim 0.01$ (CTU)

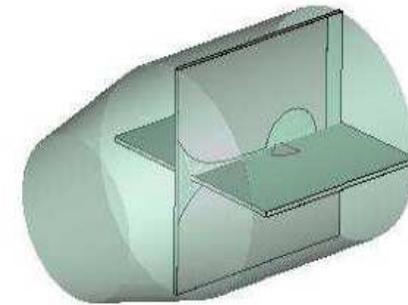
AEG3 - Wideband Antennas (coordinator KIT)



*4-50 GHz double ridge horn
DHR family from 200 MHz
(CTU)*

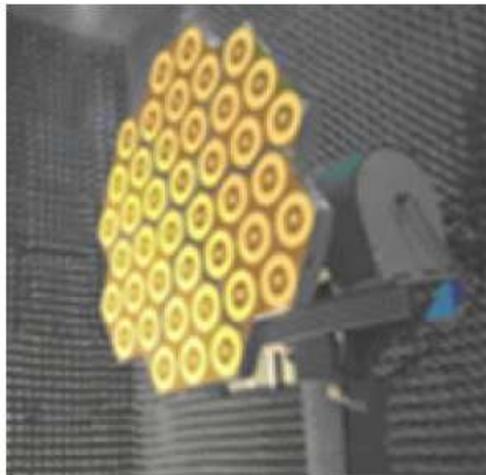


*Calculated radiation patterns
of TEM Horn without lens 12
GHz (CTU)*



*Dual polarized, integrated
antenna
(KIT)*

AEG4 – Array Antenna (coordinator UPM)



***GALILEO antenna
(Courtesy of EADS-
CASA, Spain).***

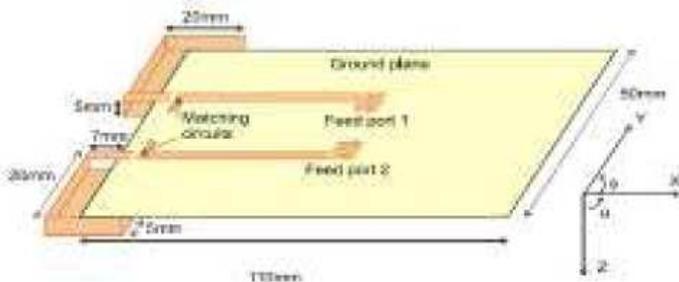


***Multibeam base station
antenna for GSM-
UMTS.***



X-band transmit-array.

AEG5 – Smart antenna (coordinator UPM)

		
<p><i>MIMO Testbed (UPM)</i></p>	<p><i>UPM new MIMO antennas</i></p>	<p><i>DVB-H MIMO antenna configuration based on capacitive coupling elements</i></p>

Claudia Casali

University of Pisa

TNO

Host advisor: Prof. Giampiero Gerini

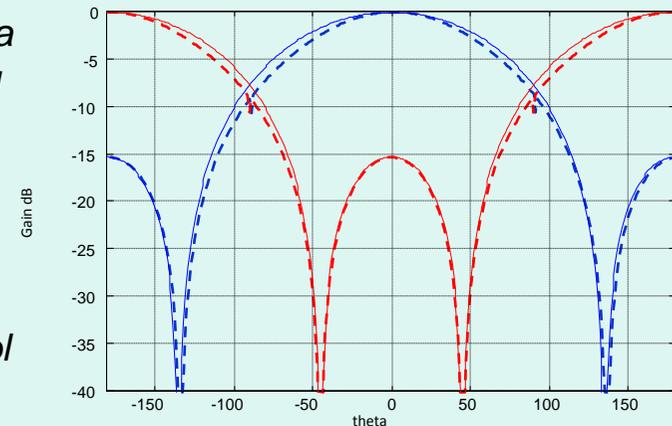
Cross-polarization reduction techniques in phased arrays

· Study and evaluate techniques to reduce the field cross-polarization components for an antenna configuration consisting of two orthogonal dipoles set along y -axis and x -axis. In order to reduce the cross-pol associated with the dipole along x (x -dipole), a weight $q(\theta, \varphi)$ can be multiplied to the amplitude of the dipole along y . This weight $q(\theta, \varphi)$ is chosen so that the following equation is satisfied:

$$y \times q(q, f) Co = -Cross$$

Antenna CAD tools evaluation

· Evaluate the computation time performances of the ADF CAD tool when applied to the analysis of large array antennas (consisting of connected array of dipoles larger than 16×16 elements with an inter element distance of $\lambda/2$).



Arnab Bhattacharya, PhD student
 Université catholique de Louvain, Belgium
 Advisor: Prof. Christophe Craeye

Laboratorio Elettromagnetismo Applicato,
 University of Siena, : prof. Stefano Maci

Realizing a cylindrical cloak in free space

Topic: Transformation Optics based cylindrical cloak in free space from the anisotropic volumetric cloak in the virtual space

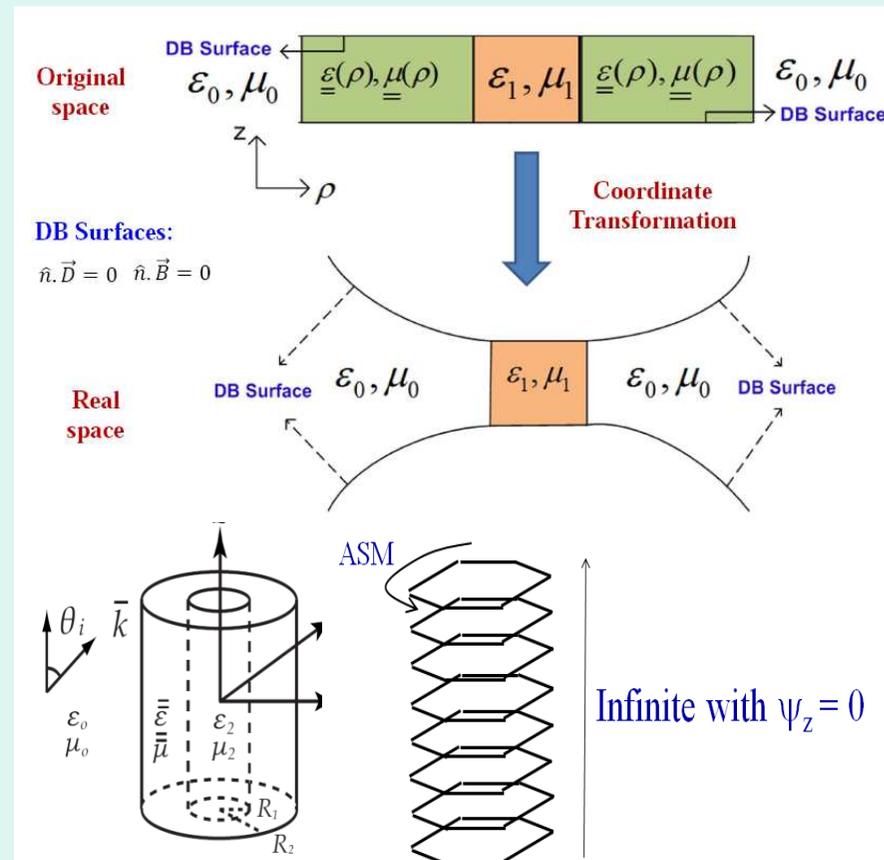
Objective: to realize a cloak for dual polarization by using DB surfaces to fulfill the boundary conditions

Application: Antenna decoupling

Numerical analysis: Full wave simulation of the free space cloak using a software based on Method of Moments developed at UCL

Analytical formulation of the anisotropic volumetric cloak based on a Differential Equation formulation

Measurements: construction of the cloak and experimental validation through field scattered measurements (to be done in



Marko Bosiljevac

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Advisor: Prof. Zvonimir Sipus

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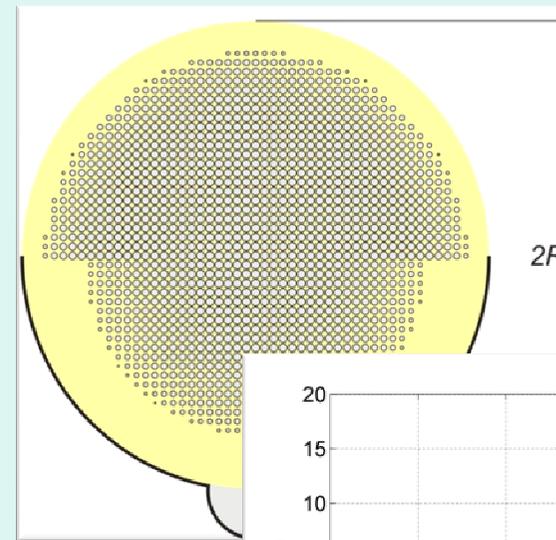
Planar Luneburg lens based on Metasurfaces

Research summary: Analysis, design and development of a highly directive Luneburg-lens based antenna realized using the concept of surface impedance modulation inside a parallel-plate structure.

Analysis method: MoM

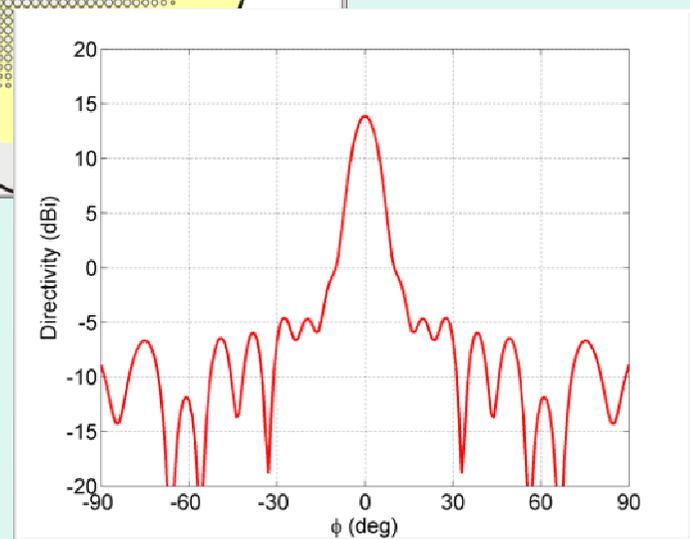
Realization: a prototype has been fabricated and tested

Measurements: experimental validation will be done in April, in a successive visit of Marko in Siena

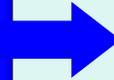


Top view of the antenna

Simulated radiation pattern in the H-plane



Jan Kracek, PhD student
Czech Technical University
Advisor: Prof. Milos Mazanek



Laboratory of Elettromagnetic Applications
University of Siena,
Host advisor: Prof. Stefano Maci

Wireless power supply through surface waves

The principles suitable for wireless power supply of Notebook by surface waves has been investigated.

Operational Frequency: 2.5 Ghz

Coupling method: Surface waves on periodic grating

Analysis Method: Mode Matching

Coupling System: loaded FSS on PC case

Prototype: foreseen in a next visit

Measurements: foreseen in a next visit



Conclusion

- ***Much antenna expertise is available in CARE***
- ***Secondments are available in most antenna areas***