Department of Waves and Associated Systems

Research Themes:
- Multifunctional Antennas
- Electromagnetic Compatibility
- Wireless Networks
- Waves and Health
- Pulsed Devices
- Ultra Wideband

Keywords:
- Waves
- Electromagnetism
- Antennas
- Wireless Networks
- EMC Electromagnetic Compatibility
- Pulsed UWB (Ultra Wide Band)
- Bioelectro-magnetism

2012
In the OSA department, interactions of electromagnetic waves with targets are analysed through both theoretical (software development) and experimental approaches. The properties identified lead to the design of systems in the fields of telecommunications, radar, EMC, etc. More precisely five complementary research areas are developed:

- "Multifunction antennas" that are based on several patents of the department and incorporate three strong areas: metamaterial antennas, miniature antennas and high-performance arrays.

- Closely linked to the previous antenna development, the "wireless network" activity analyses network coverage, channel propagation optimization, the diversity (MIMO), indoor-outdoor connection issues, etc.

- Spurious emissions and their effects on electronics are studied by the Electromagnetic Compatibility (EMC) team through the development of powerful simulation tools and experimental approaches implemented in the reverberation chamber and various simulators.

- Ultra wideband systems are studied by our team located in Brive using metrological applications via the transient field, UWB radars and electronic warfare.

- Use of electromagnetic waves must be accompanied by an assessment of the levels emitted to the human body (protection of persons). The “Bioelectromagnetism” team analyses the interaction between electromagnetic waves and living cells and, hand-in-hand with doctors and biologists, defines systems for exploiting it.
KEY FIGURES
(at 1st January 2012)

Teacher-researchers: 17  
EPST and EPIC researchers: 5  
Other researchers: 8  
HDR (accredited to direct research): 2  
Doctoral students in 2011-2012: 27  
Engineers, technicians: 3  
Administrative agents: 2.5  
Dissertations defended (2008-2011): 36  
Current ANR (French National Research Agency) projects: 4,  
FUI (Single Interministerial Fund): 2  
(REcess + RWU (Remote Wake-Up)+ALPAGA),  
PEA (Upstream Study Project): 1 (DGA - Directorate General for Armaments)  
Current European projects: 2 (IDEATA – NETUN)  
Others: 2 D.I.L, 2 ELIARE, 3 F.I.L.  
(SYSMART – LABSYS – WOBNET), REGION/ERDF

PARTNERSHIPS

Active National University Partnerships:  
IETR Rennes (ANR), LGE Pau (P.E.A.), ENST (Paris),  
LEST (Brest), IRENA (Nantes), LEAT (Nice), EM2C (CNRS Paris),  
AMPERE (CNRS Lyon), Vigicell (Villejuif), NAMC (CNRS Orsay), CRSSA (Grenoble), IMS (CNRS-ENSCPB Bordeaux), IPBS (CNRS Toulouse), Neurology Lab.  
(Limoges Faculty of Medicine), Vectorology and Gene Transfer Lab. (CNRS Villejuif).

Current International University Partnerships:  
University of Navarre - Pamplona (Spain)  
Moscow Institute of Biophysics (Russia)

National Industrial Partnerships:  
THALES, THALES ALENIA SPACE, THOMSON  
RADIALL, FRANCE TELECOM, LEGRAND, A NOVO,  
SATIMO, EUROPULSE, PROTOTIG, CRYPTIRIS  
ADVANTEN, MARTEC, ETSA, ADETEL, PRANA,  
AMCAD, DASSAULT AVIATION, CNES, EADS.

ECONOMIC ADDED VALUE
(2008-2011)

Number of patents filed: 3 licences  
Start-up created as a result of research activities since 2005: Devopsys
SCIENTIFIC PRODUCTION
OF RESEARCH TEAM
(2008-2011)

International articles: 98
Articles: 83 in peer-reviewed journals
Works: 2
Book chapters: 1
Conference presentations: 228

Major publications and/or patents over the last 5 years


