



UNIVERSITY: Public University of Navarre (UPNA)

WIT PROGRAMME'S RESEARCH LINE NAME:

High capacity communications in THz – Tunable broadband RCS reduction using liquid crystals

DOCTORAL PROGRAMME: Doctorate in Communications Technology, Bioengineering and Renewable Energies: <https://www.unavarra.es/escuela-doctorado/doctorate-programs/current-plan/engineering-and-architecture/doctorate-in-communications-technology-bioengineering-and-renewable-energies?languageId=1>

COMPLETE DESCRIPTION OF THE LINE

Radar Cross Section (RCS) reduction has experimented great interest during the last decades. Achieving cloaking or transparency of an object against electromagnetic waves is key in certain applications. The use of metamaterials in planar structures makes possible the redirection of the impinging field in a structure in directions different from the specular one. Therefore, it is possible to reduce the RCS using a flat and thin configuration that can be easily integrated into any surface obtaining broadband working bandwidths. There are several techniques for their design based on phase cancellation using structures with periodicity or structures with random arrangement of the elements (coding). In addition, absorbing substrates are included to increase the reduction. Operating bandwidths of 60% - 100% can be achieved with these configurations. The use of liquid crystals would allow tunability of the working bandwidth making the structure much more attractive and challenging.



RESEARCH GROUP NAME:

Antenna Group

COORDINATOR:

- Last and first name; link to the “Portal of scientific production”:
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https://academicos.unavarra.es/CawDOS//jsf/seleccionActividades/seleccionActividades.jsf?id_pers=3696&idioma=es&elmeucv=N
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ANOTHER RESEARCH LINES OF THE GROUP: list of them

- Antennas
- Metamaterials and periodic structures
- THz technology and applications



- Quantum technologies
 - Sensing
 - Thermal emission
 - Microfabrication
-
- Entities involved in research lines and contact person:
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- Brief group overview

UPNA's Antenna Group has been actively working on different areas of applied electromagnetics for more than 20 years. During these years, it has become a world reference group in metamaterials and nanophotonics, as well as in other areas of applied electromagnetics, such as terahertz technology and corrugated horn antennas.

The group has 6 permanent members, 1 Ramón y Cajal fellow, 4 Post-Docs and 8 PhD students. During the last decade the group averages yearly more than 18 journal publications and attracts funds over 500.000 € per year from public and private sources. Out of these, the group is currently involved in 4 international research projects, among them projects ERC-2020-STG-948504 (ERC Starting Grant), H2020-FETOPEN-964450 and H2020-MSCA-ITN-2019-MENELAOS^{NT}.

Its state-of-the-art facilities for manufacturing and test comprise an ISO-7 clean room for microfabrication and test equipment from RF to the IR, including the THz range.



<http://www.unavarra.es/antennas-group>

- Link of the group to the “Portal of scientific production”
<https://academicos.unavarra.es/CawDOS/?id=90701b928ac24ad4&idio=es&tipo=actGrupo>

REQUIRED QUALIFICATIONS: Engineering, Physics, Technology

Use of full-wave electromagnetic simulators. MSc Thesis in a topic in the field of electromagnetics/RF/antennas