

ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

DM630/Leonardo - Design & development of methodologies & systems for radar cross section measurements in hybrid or non-perfectly anechoic environments

Funded By	LEONARDO S.p.A. (Roma) [P.iva/CF:00881841001] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584]
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Context of the research activity	<p>The doctoral research topic is located within the development of "Radar Stealth" technologies in the aeronautical sector and it will be focused on the development and experimental testing of radar cross section measurements</p> <p>Progetto finanziato dal PNRR a valere sul D.M. 630/2024 - CUP E14D24002420004</p>
Objectives	<p>The activity will consist of carrying out Radar Cross Section (RCS) measurements in spherical wave conditions in closed environments not specifically designed for this type of test. The activity is aimed at defining the modifications of a general-purpose building or an anechoic chamber to test electromagnetic compatibility, defining the primary modifications necessary to allow RCS tests to be carried out with sensitivity adequate for a first phase of optimization of models or components. The modifications could consist in the shielding of non-removable structural elements and/or in the removal of pre-existing systems/installations that are not necessary for the purposes of the test, the insertion of absorbent material in specific points to reduce unwanted echoes that cannot be effectively erased via software of experimental data processing, as well as the evaluation of the test structures to be inserted and their impact on the overall performance of the system.</p> <p>Moreover, innovative functional testing methodologies, suitable for RF end-to-end antenna testing, will be developed. The aim is a radical under-sampling via the insertion of a-priori information by way of suitable use of advanced numerical modeling tools. The methodology will be used also with non-canonical grids, and when only a limited number of measured points is</p>

Objectives	<p>available.</p> <p>The proposed activity falls within the general objective of the PNRR M1C2 "Digitalisation, innovation and competitiveness in the production system" in order to increase innovation in the production system by encouraging investments in advanced technologies, research and innovation.</p> <p>The PhD research activity will be in collaboration with Leonardo S.p.A, an international industrial group that creates technological capabilities in the Aerospace, Defense & Security sectors. A protagonist of the main strategic programs at a global level, it is a technological partner of governments, defense administrations, institutions and companies. Its main areas of activity are: helicopters, defense and security electronics, aircraft, aerostructures, space and cybersecurity. Digital technologies are the essential element of Leonardo's innovation, in all areas of activity and in the entire value chain, from research laboratories to delivery to the market. Leonardo can leverage an innovation ecosystem capable of intercepting new technological solutions and oriented towards continuous synergy between the different business sectors.</p>
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Skills and competencies for the development of the activity	<ul style="list-style-type: none">- Expertise in electromagnetic (EM) modelling and simulation- Expertise in antenna design, realization and measurements- Capabilities in programming with e.g. C/C++ and Matlab- Knowledge of 3D EM softwares
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