LAUNCH OF EU DEFENCE FUND PROJECT iFURTHER

Cognitive Network of HF-Radars: A Revolutionary Enhancement of European Defence

The threat spectrum faced by the European Union is broadening and demands a new and robust capability to complement existing assets and address increasingly complex challenges. The EU-funded project iFURTHER will focus on a disruptive system of systems defence concept that is fit for this purpose and thus is capable of protecting the sovereignty and integrity of the European Union.

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Emerging military threats to the EU, including hypersonic and ballistic threats, clearly demonstrate the need for very early warning systems. Given the threat spectrum, it is evident that no single technology or single system can address all threat types in all situations. The iFURTHER project will therefore conceptualise a cognitive network of high-frequency radars as a disruptive future defence capability to protect the EU.

iFURTHER's approach

iFURTHER addresses wide area air and sea covert surveillance by developing new concepts of over-the-horizon radar to be integrated into a collaborative network of high-frequency sensors. Ultimately, the project will contribute to developing a persistent and very wide-area EU defence capability to monitor air and sea domains by delivering a concrete and scalable solution. In particular, iFURTHER's objectives are to:

- Detect and track air and sea targets at long range (over the horizon), far beyond currently existing systems, by using the reflections of skywave and surface-wave propagated signals.

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- Fill gaps and extend the current EU air and sea radar coverage by introducing a multistatic sensor configuration supported by ad-hoc network protocols and an appropriate infrastructure for synchronisation and coordination of sensors (e.g., C2).
- Implement cognitive radar management systems to optimise operational parameters in real time and as a function of environmental conditions (e.g., the state of the ionosphere), based on robust ionospheric models and sounding protocols (not excluding the development of ionospheric sensors).
- Implement advanced signal processing techniques to improve over-the-horizon detection and track performance as well as target localisation capabilities.
- Utilize available non cooperative illumination and apply cognitive features at network level to develop new techniques for optimized use of the electromagnetic spectrum and passive processing.

Consortium

The iFURTHER consortium consists of 18 partners (4 industrials, 7 RTO and 5 SMEs) from 10 countries. All partners possess excellence in their respective field and provide complementary know-how for the successful completion of the project.

The partners are listed below (short names in brackets):

1. Hellenic Aerospace Industry S.A. (HAI), Greece
2. Office National d'Etudes et de Recherche Aérospatiales (ONERA), France
3. National Observatory of Athens (NOA), Greece
4. i-Matik Ltd (IMTK), Greece
5. Consorzio Nazionale Interuniversitario per le Telecomunicazioni (CNIT), Italy
6. Istituto Nazionale di Geofisica e Vulcanologia (INGV), Italy
7. Warsaw University of Technology (WUT), Poland
8. Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. (FHG), Germany
9. HELZEL Messtechnik GmbH (HZM), Germany
10. tms technisch-mathematische Studiengesellschaft mbH, Germany
11. INDRA Sistemas S.A. (INDRA), Spain
12. University of Alcalà (UAH), Spain
13. BHE Bonn Hungary Electronics Ltd. (BHE), Hungary
14. Signal GeneriX Ltd (SG), Cyprus
15. Patria Aviation Oy (PATRIA), Finland
16. ERA a.s. (ERA), Czech Republic
17. Ministry of National Defence, Greece (HMOD), Greece
18. L-up SAS (LUP), France

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Key facts

iFURTHER (full title: “hIgh FreqUency oveR The Horizon sensors’ cognitivE netwoRk“) is a 3-year research project funded by the European Defence Fund under Grant Agreement No. 101103607 with a total budget of 10.95 million Euros. Starting date: December 1st, 2022.

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