Project Green Blade

Aveillant Theia, enabling radar friendly wind energy

WindEurope Offshore, Copenhagen, 27 November 2019

Aveillant - Background

- Founded Oct 2011, a spin out from Cambridge Consultants
- Core technology – configurable and scalable 3D staring radar – the Holographic Radar Platform
- Foundation application – wind farm mitigation
- Additional in 2016 – detection and tracking of small UAS – Drones
- Acquisition by Thales November 2017

Aveillant

Our vision

To lead the transformation of radar for the information age, by providing a rich and fully digital picture of the sky

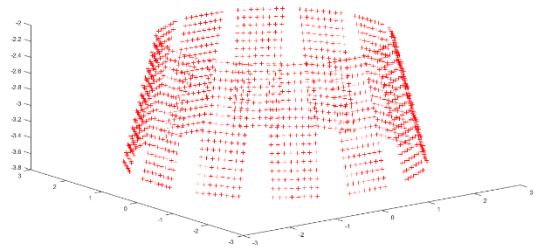
Holographic Radar

Holographic Radar is a fully digital and modular, staring radar platform that can be applied flexibly to multiple application areas.

The solution will continuously develop and be continuously deployed to allow our customers to keep ahead of the challenges they face

Holographic Radar Configurations

Modular structures, configured with common components



From 5nm at East Midlands Airport

Theia progression extended range >50nm

Theia: a key enabler for Project Green Blade

Theia achieves immunity against wind farm false alarms

D1

Theia, a staring radar, surveys its whole Field of Regard permanently rather than scanning around it

D2

Theia dwells on all targets, all the time, yielding information to characterise them in detail

D3

Theia technology lends itself to a network approach to surveillance

D4

Theia architecture and processing yield lower through life costs

1. Theia is a staring radar

Theia is a staring radar. It surveys its whole Field of Regard permanently instead of scanning a narrow beam around it

Its sensitivity matches that of scanning radar

It acquires continuous detail about each object

It can be specified to acquire sufficient detail to resolve and discriminate each object type’s dynamics

2. Theia dwells on all targets

Theia dwells on all targets, all the time, yielding information to characterise targets

- Theia acquires all fine-motion detail in the Doppler spectrum
- Turbine motions are repetitive in fine detail
- Aircraft follow trajectories, or hover
- Doppler signatures are different
- Theia can therefore reliably differentiate the two, reporting aircraft but not turbines

3. Theia's networked potential

Theia technology lends itself to a network approach, overcoming shadowing issues

01

The basic Theia design has physically separated (but co-located) transmitter and receivers

02

This means it lends itself to use of further separation of transmitter and receivers – bi-static or *multi-static* approach

03

Multiple Theias do not interfere with each other but can form a co-operative network

04

Such a multi-look network naturally overcomes the shadowing problem

05

Performance is enhanced by a coherent Theia network

4. Theia’s lower through life costs

Theia has no moving parts, giving ease of maintenance and lower through life costs

- Theia is based on intensive data processing
- Theia has no expensive moving parts that wear out
- Architecture using many receiver tiles means failure of a single tile has minimal impact on overall performance – “graceful degradation”
- Ease of maintenance supports low through-life costs
- Data processing (GPUs, data storage) is increasingly cost-effective

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