

EPIC AGM AND SUMMIT

MBDA VISION: CHALLENGES AND OPPORTUNITIES FOR PHOTONICS

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MBDA Missile Systems

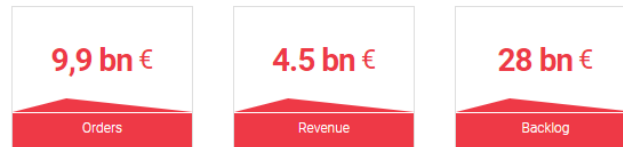
EO Technologies Group Leader (UK)

MBDA Missile Systems

- MBDA – who we are
- Current Challenges for Missile System Photonics
- Future Challenges for Missile System Photonics
- Future Opportunities for Missile System Photonics


www.mbda-systems.com

MBDA Financial Results 2023



3 THINGS TO REMEMBER ABOUT MBDA

The only integrated defence company to provide missiles and missile systems for each branch of the armed forces (air, sea, land).

A multi-national group with more than 15.000 employees working together across France, Germany, Italy, Spain and the United Kingdom. Offices also set up in USA.

A joint venture of the 3 European leaders in aerospace and defence: Airbus (37.5%), BAE Systems (37.5%) and Leonardo (25%).

Current Challenges for Missile System Photonics

- High performance systems
 - Long range / high performance in a demanding environment
 - Significant driver on cost and complexity
 - Most systems cryogenically cooled, adding Size, Weight and Power (SWaP)
- 24 hour capability
 - Generally IR systems
- High resolution with wide Field of Regard
 - Gimbaled systems
- Hostile lifing environment
 - Air carriage – temperature/vibration
 - But also long life span



Future Challenges for Missile System Photonics

- **Reduced Size Weight and Power (SWaP)**
 - Enabler for Multi-sensor systems as well as smaller missiles
 - Opportunity for freeing highly valuable space on a missile system
 - Desire for high performance High Operating Temperature (HOT) or uncooled detectors
- **Reduced cost**
 - Computational Imaging approaches as an enabler for lower cost but high performance seeker systems
- **Improved seeker robustness to a diverse and challenging target set**
 - Multi-sensor sensing
 - Data fusion – utilise the best attributes from each sensor
- **Higher speeds - Hypersonic capability coming into focus**
 - Very high temperatures
 - Long range acquisition and track
- **Test and Evaluation**
 - Need for infrastructure and facilities matched to weapon seeker capabilities



UK Outlines Hypersonic Weapons Development Strategy

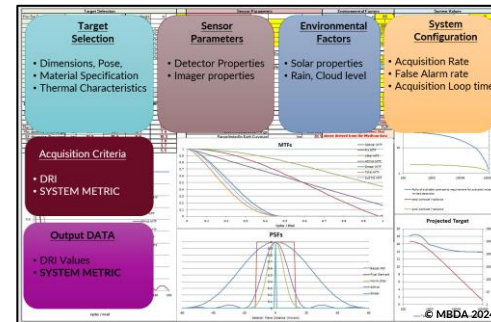
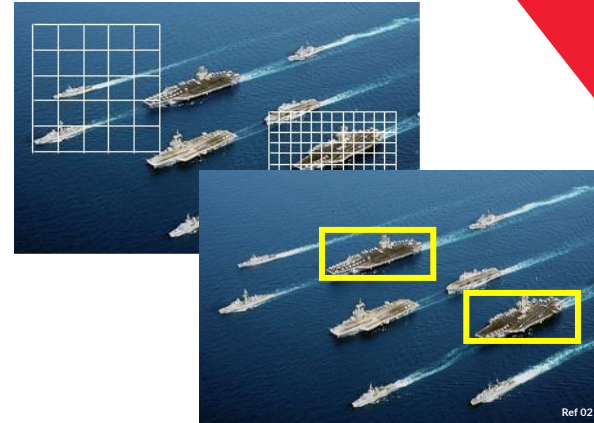
Tony Osborne July 20, 2023

Source: Aviation Weekly



Future Opportunities for Missile System Photonics

- Computational Imaging for Improved Performance
 - Super Resolution, and multiple apertures
 - Digital Processing (Focussing, Filtering)
- ‘AI’ for Improving Target Acquisition
 - The role of Machine Learning to support ‘Operator in the Loop’
 - Autonomous systems - needs to be robust, but not necessarily image based
- Tools for predicting Detection Recognition and Identification (DRI)
 - More representative of the system
 - Wider range of technologies and environments
- Opportunity for ‘bottom-up’ novel capabilities



Closing Remarks

- MBDA
 - European Missiles Systems Company (UK, Fr, Ge, It, Sp)
 - Overall missile performance enabled by EO seeker capability
- Current systems require significant engineering to overcome challenges and meet required performance
- Next generation seeker designs will need new technology and non-traditional approaches to gain additional performance
- Also opportunities for
 - Computational Imaging approaches
 - Use of AI for Improving Target Acquisition
 - More advanced DRI Tools
 - Novel photonics technologies

This allows us – as a European photonics community – to explore a broader range of technologies and techniques in order to deliver the future defence capability

End of Presentation

Thank you for your attention

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