

Design of EO systems: hot topics/trend in Leonardo Electronics

09.04.2020

EPIC Online Technology Meeting on IR imaging for Security and Surveillance

Alessandro Rossi, System Engineer

Imagers Department

Leonardo Electronics, Florence, ITALY



IDCA (Integrated Detector Cooler Assembly)

- Small pixel pitch
 - Moving towards diffraction limits
 - Rule of thumb: system size varies as the cube of pixel pitch
- High temperature IRFPAs, which relates to
 - optics cold shield efficiency;
 - cut-off wavelength;
 - well capacity.
- Cooler performances for airborne systems
 - Vibration
 - Degradation of MTF
 - MTTF
 - Linear vs. rotary

Optics

- Optics for guidance
 - Wide FOVs
- Lens coatings
 - Challenging environmental conditions
- Test of aspherical lenses
 - Optical quality assessment
- Multi-spectral optics/coatings
- Free-form optics
 - Compact and lightweight optics assembly
 - Optical quality for high aspect ratio

Image processing

- Data fusion
 - Image fusion
 - Augmented reality
- Degraded Visual Environments
 - Multi-sensor (active/passive)
 - Modeling of atmospheric conditions
 - Turbulence mitigation
- Machine learning approaches
 - IR database reliability
 - Help for decision making