Optical-radio hybrid technology in military wireless communication systems

ISBN/ISSN
ISBN: 978-1-83880-507-4 Print ISBN: 978-1-83880-506-7

Informacje dodatkowe
Proceedings Volume 11055, XII Conference on Reconnaissance and Electronic Warfare Systems; 1105506 (2019)

https://doi.org/10.1117/12.2524431
Event: XII Conference on Reconnaissance and Electronic Warfare Systems, 2018, Oltarzew, Poland

DOI/10.1117/12.2524431

Abstract: Military wireless communication systems provide services using radio transmission technologies. However, this technology is exposed to modern radio-electronic warfare devices. In some operational scenarios, an application of laser data link (Free Space Optics - FSO) makes it possible to increase data transmission reliability and security. Such capability could be obtain using so-called hybrid FSO/RF communication system. The development of optoelectronic devices (lasers and photodetectors) operated in the spectral range of 8 – 12 μm (Long Wavelength Infrared Radiation - LWIR) enabled to construct a new FSO link. Compared to currently used FSO systems operating in 700-900 nm (NIR) or 1300 – 1550 nm (SWIR) spectral ranges, this link is characterized by less sensitivity to atmospheric phenomena (fog, mists or turbulences) and by greater difficulty of detection. The performed analyses shown that the use of FSO/RF technology systems can provide increase in data transmission security, link availability, secretiveness of operation, and immunity to intentional interference. The paper presents virtues of some wireless communication technologies based on radio, optical and hybrid system configuration. The status of the research on FSO link operated at LWIR wavelength range is also described. This study has been performed in the frame of LasBITer project financed by The Polish National Center of Research and Development. The developed optical data link is a unique device in relation to the FSO technologies available today, because of its operation in LWIR spectrum using quantum cascade lasers and HgCdTe detectors. Scenario of FSO/RF data link works in military operation is also presented.

Powiązane publikacje

- Proceedings of SPIE, XII Conference on Reconnaissance and Electronic Warfare Systems

Adres url strony

https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11055/1105506/Optical-radio-hybrid-technology-in-military-wireless-communication-systems/10.1117/12.2524431.short