

Applications of Digital Holographic Imaging at Lockheed Martin Coherent Technologies. Philip Gatt and Samuel T. Thurman, Lockheed Martin Coherent Technologies (USA).

ABSTRACT

In this paper, we provide an overview of the various unique applications of digital holographic imaging being developed at Lockheed Martin Coherent Technologies (LMCT). Digital holography is a coherent detection imaging scheme which provides direct access to the signal complex amplitude (amplitude and phase) with near single photon sensitivity. This enables many day/night active imaging paradigms including range, Doppler, multi-aperture, synthetic aperture, and inverse synthetic aperture imaging. We review the digital holographic approach and describe LMCT's research and development activities in these unconventional imaging technologies using fundamentally the same hardware. We also show key dual relationships between range and Doppler imaging and describe the similarities between synthetic and inverses synthetic aperture imaging.