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Enhancing THz Absorption using Thin-Film Multilayer Stacks<sup>1</sup> DRAGOSLAV GRBOVIC, CHRISTOS BOLAKIS, GAMANI KARUNASIRI, Naval Postgraduate School, SRL TEAM — Terahertz imaging has seen significant proliferation in recent years. This band of electromagnetic spectrum has been underutilized for a long time due to the lack of sufficiently powerful sources and sensitive detectors. Because of virtually harmless effects on living tissue, terahertz (THz) radiation is attractive for various applications, ranging from non-invasive medical diagnostics to detection of concealed weapons. Our work focuses on identifying materials, or more specifically a stack of thin-films with increased absorption in the band of interest. In this work, we demonstrate a method that combines finite element modeling, thin-film deposition and experimental characterization to create highly-absorptive multi-layer stacks. Finite element modeling is used to simulate the absorption of a combination of thin dielectric and metallic films. Metals are deposited using e-beam evaporation and dielectric films using plasma enhanced chemical vapor deposition (PECVD). The simulated and measured THz absorption characteristics of the composite thin-film multilayer stacts will be presented.

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