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$BaTiO_3$ photonic crystal electro-optic devices for 50 GHz applications

Bruce Wessels, Jianheng Li and Zhifu Liu
Northwestern University, USA

Due to an exponential increase of information processing and communications traffic requirements, there are needs for active devices for photonic integrated circuits that operate at 50 GHz and above. One way to increase the bandwidth of an EO modulator is to decrease its size. In this paper, we report the simulation, design, fabrication and characteristics of a millimeter scale, EO modulator operating in the V-band at a wavelength of 1550 nm based on $BaTiO_3$ thin film platform. Using two-dimensional photonic crystal (PhC), decreasing its length and optimizing device design based on our recent simulations of EO and microwave characteristics 50 GHz devices were demonstrated. Integration of these active devices on silicon will also be discussed.

Biography

Bruce Wessels is the W.P. Murphy Professor of Materials Science and Engineering, and Electrical Engineering and Computer Science at Northwestern University. He received his undergraduate degree from University of Pennsylvania and PhD degree in Materials Science from MIT. He is a fellow of APS, OSA and ASMI. He is author/co-author of 360 articles on electronic, magnetic and optical properties materials and devices. He is the holder of 15 U.S. patents. He is a former President of TMS.

b-wessels@northwestern.edu

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