

High speed terahertz modulation from metamaterials with embedded high electron mobility transistors

Tuesday, 24 July 2012 20:00 (2 hours)

David Shrekenhamer, Department of Physics, Boston College, USA
Saroj Rout, NanoLab, Electrical and Computer Engineering, Tufts University, USA
Andrew Strikwerda, Department of Physics, Boston University, USA
Chris Bingham, Department of Physics, Boston College, USA
Richard Averitt, Department of Physics, Boston University, USA
Sameer Sonkusale, NanoLab, Electrical and Computer Engineering, Tufts University, USA
Willie Padilla, Department of Physics, Boston College, USA

We have designed and demonstrated the performance of a novel terahertz (THz) device resulting from hybridization of metamaterials (MMs) with pseudomorphic high electron mobility transistors (HEMTs), fabricated in a commercial gallium arsenide (GaAs) process. Monolithic integration of transistors into each unit cell permits modulation at the metamaterial resonant frequency of 0.46 THz. Characterization is performed using a THz time-domain spectrometer (THz-TDS) and we demonstrate modulation values over 30%, and THz modulation at frequencies up to 10 megahertz (MHz).

Primary author: SHREKENHAMER, David (Boston College)

Presenter: SHREKENHAMER, David (Boston College)

Session Classification: Poster Session 2

Track Classification: Plasmonics / Metamaterials