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Phase measurements on a subwavelength optical metamaterial based on metallic paired strips TRAVIS AUTRY, University of Texas, KARA MALLER, THOMAS JARVIS, XIAOQIN LI, DIMITRIY KOROBKIN, GENNADY SHVETS, MARCELO DAVANCO, XUHUAI ZHANG, STEPHEN FORREST, DEPARTMENT OF PHYSICS-UNIVERSITY OF TEXAS, AUSTIN COLLABORATION, DEPARTMENT OF PHYSICS-UNIVERSITY OF MICHIGAN, ANN ARBOR COLLABORATION, DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE- UNIVERSITY OF MICHIGAN, ANN ARBOR COLLABORATION — There are no known naturally occurring material with negative index of refraction due to the fact that the electrical resonances and the magnetic resonances don't overlap in frequency. However, artificially engineered materials, known as metamaterials, can be designed to exhibit such peculiar properties. We study a subwavelength optical metamaterial composed of paired gold strips separated by continuous gold film. According to theoretical calculations, this structure is expected to display a negative index of refraction in the near-infrared. We have performed phase measurements of the material using a polarization interferometer in the range of 750-960 nm using a Ti: Sapphire laser. We are in the process of extending the measurement to a longer wavelength range using a supercontinuum. The phase information of the transmitted and reflected wave at various wavelengths is critical for characterizing the index of refraction.

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