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Strong Broadband Resonances Observed between 1 and 3 microns from Nanolithographically Fabricated Metallic Metamaterials[1] MICHAEL C. MARTIN, ZHAO HAO, Advanced Light Source, Lawrence Berkeley National Laboratory, 1 Cyclotron Rd, Berkeley, California 94720, BRUCE HARTENECK, ALEX LIDDLE, STEFANO CABRINI, Center of X-Ray Optics and Molecular Foundry, Lawrence Berkeley National Laboratory, 1 Cyclotron Rd, Berkeley, California 94720, WILLIE J. PADILLA, Department of Physics, Boston College, 140 Commonwealth Ave., Chestnut Hill, MA 02467 — We report in this talk strong broadband absorption resonances mid- and near-infrared frequencies from our nanometer size metamaterial resonators. We report a systematic study of these resonances with different dimensions of the resonators and their spacing, combined with our theoretical simulations. We will present our experimentally measured reflection at different incidence angles, and transmission of those resonators with different feature sizes and different lattice spacings which control the coupling between neighboring units. We found distinctively strong and broadband resonance in the spectrum of the resonators. We will discuss how our results can be used to introduce strong electric and magnetic responses and could provide a route to broadband negative refraction.

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