

Abstract Submitted  
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**Super-Lensing and Sub-Wavelength Antennas in Mid-IR Using Silicon Carbide**<sup>1</sup> GENNADY SHVETS, DMITRIY KOROBKIN, YAROSLAV A. URZHUMOV, CHRISTIAN ZORMAN, The University of Texas at Austin — Extraordinary properties of SiC in mid-infrared (negative dielectric permittivity and small losses) make it an ideal building block for making negative index metamaterials in that important part of the electromagnetic spectrum. We report on a series of experiments demonstrating that thin films of SiC can be used as a “perfect” near-field lens. We have theoretically designed and experimentally implemented a super-lens ion mid-IR using SiC. We also report excitation of electrostatic resonances of two structures based on a sub-micron film of crystalline silicon carbide: (a) nano-holes drilled in the free-standing SiC membrane, and (b) metallic nano-posts evaporated on the SiC membrane. Applications of nano-hole resonances to excitation of magnetic moments in nano-structured SiC and development of negative index materials will be discussed, as will be the prospects of using nano-structured SiC films for laser processing of materials on a nanoscale.

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