Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Nonperiodic metallic gratings transparent for broadband terahertz waves REN-HAO FAN, XIAO-PING REN, RU-WEN PENG, Nanjing University, XIAN-RONG HUANG, Argonne National Laboratory, MU WANG, Nanjing University — Recently, we demonstrate both theoretically and experimentally that nonperiodic metallic gratings can become transparent for broadband terahertz waves. Quasiperiodic and disordered metallic gratings effectively weaken and even eliminate Wood's anomalies, which are the diffraction-related characters of periodic gratings. Consequently, both the transparence bandwidth and transmission efficiency are significantly increased due to the structural aperiodicity. Furthermore, we show that for a specific light source, for example, a line source, a corresponding nonperiodic transparent grating can be also designed. We expect that our findings can be applied for transparent conducting panels, perfect white-beam polarizers, antireflective conducting solar cells, and beyond. References: X. P. Ren, R. H. Fan, R. W. Peng, X. R. Huang, D. H. Xu, Y. Zhou, and Mu Wang, Physical Review B, 91, 045111 (2015); R. H. Fan, R. W. Peng, X. R. Huang, J. Li, Y. Liu, Q. Hu, Mu. Wang, and X. Zhang, Advanced Materials, 24, 1980 (2012); and X. R. Huang, R. W. Peng, and R. H. Fan. Physical Review Letters, 105, 243901 (2010).

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Date submitted: 19 Oct 2015 Electronic form version 1.4