

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Optical Conductivity in the Cuprates from Unparticle¹ KRIDSANAPHONG LIMTRAGOOL, University of Illinois at Urbana-Champaign, JIMMY HUTASOIT, Leiden University, PHILIP PHILLIPS, University of Illinois at Urbana-Champaign — The optical conductivity of optimally doped cuprates above the superconducting dome exhibits a universal power law of the form, $\omega^{-\frac{2}{3}}$. Unparticles, scale-invariant matter with an algebraic propagator, is a candidate to explain this phenomenon. We explore the possibility of using unparticle to produce such power law behavior. We apply unparticle-gauge couplings and linear response theory at finite temperature to calculate the optical conductivity. We find that simply expanding a four-point correlation function using Wick's theorem is not sufficient to obtain the power law. We investigate the role played by non-Wick processes in determining the power law

¹We would like to thank NSF Contract No. DMR-1104909 for partially funding of this project. K. L. is supported by the Department of Physics at the University of Illinois and by the Ministry of Science and Technology, Royal Thai Government.

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Date submitted: 14 Nov 2014

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