Abstract Submitted
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Metamaterial approach to superconducting critical temperature increase[1] CHRISTOPHER JENSEN, KATHRYN ZANDER, BRADLEY YOST, THOMAS GRESOCK, WILLIAM ZIMMERMAN, Towson University, JOSEPH PRESTIGIACOMO, HEUNGSOO KIM, MICHAEL OSOFSKY, Naval Research Laboratory, SHANTA SAHA, RICHARD GREENE, IGOR SMOLYANINOV, University of Maryland, VERA SMOLYANINOVA, Towson University — A dielectric response function plays a significant role in electron-electron interaction. Recently we proposed that the metamaterial approach to dielectric response engineering may increase the superconducting critical temperature. A composite superconductor-dielectric metamaterial has been tested in experiments with compressed mixtures of tin and barium titanate nanoparticles of varying composition. An increase of the critical temperature of the order of 5 percent compared to bulk tin has been observed [1]. Measurements of dielectric function was found to be in agreement with our model. A role of dielectric and particle size will be demonstrated. Different metamaterial approaches will be discussed [2]. [1]. V. N. Smolyaninova, et al., Scientific Reports 4, 7321 (2014); [2]. I. Smolyaninov and V. N. Smolyaninova, Phys. Rev. B 91, 094501 (2015)

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