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Enhancing Superconductivity in Hyperbolic Metamaterials WILLIAM ZIMMERMAN, CHRISTOPHER JENSEN, Towson Univ, JOSEPH PRESTIGIACOMO, MICHAEL OSOFSKY, Naval Research Laboratory, IGOR SMOLYANINOV, University of Maryland, VERA SMOLYANINOVA, Towson Univ — Recent experiments have demonstrated the viability of the metamaterial approach allowing for the enhancement of the critical temperature of a superconductor [1, 2]. Dielectric response engineering was used to enhance electron-electron interaction in core-shell epsilon near zero (ENZ) metamaterials. We have also demonstrated that an aluminum/aluminum oxide hyperbolic metamaterial geometry (aluminum/aluminum oxide multilayers) is capable of Tc enhancement [1]. This approach has superior transport and magnetic properties compared to core-shell metamaterial superconductors [2]. Here we report the Tc enhancement in tin/dielectric multilayers. Reflectivity measurements were made to confirm the hyperbolic character of fabricated metamaterial. Effect of metamaterial cell size on Tc will be discussed. [1]. Vera N. Smolyaninova et.al, Scientific Reports 6, 34140 (2016) [2]. Vera N. Smolyaninova et.al, Scientific Reports 5, 15777 (2015).

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