Abstract Submitted
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Measurements of the superconducting proximity effect in Pd/Al NS bilayers at GHz frequencies. ANI NERSISYAN, RICCARDO MANENTI, MICHAEL PETERER, EINAR MAGNUSSON, GIOVANNA TANCREDI, ANDREW PATTERSON, PETER LEEK, University of Oxford, Oxford, UK — The superconducting proximity effect, well known since the 1960s, describes superconductivity in the case of a superconductor contacted to a normal metal, and is typically studied experimentally using transport techniques such as tunneling spectroscopy [1-4]. Here we will present studies of the superconducting proximity effect in thin film palladium/aluminum NS bilayers using microwave frequency lumped element LC resonators. Measurements of the resonance frequency and quality factor as a function of temperature and film thickness reveal properties of the NS bilayers such as the critical temperature and penetration depth. Our results should be useful for understanding losses in superconducting quantum circuits that incorporate thin normal layers, and, in the particular case of Pd, should aid in design of hybrid superconducting quantum devices incorporating carbon nanotubes with high contact transparency [5]. [1] C. J. Adkins and B. W. Kingston, Phys. Rev 177, 777 (1969). [2] J. R. Toplicar and D. K. Finnemore, Phys. Rev. B 16, 2072 (1977). [3] A. Kastalsky, et. al., Phys. Rev. Lett. 64, 958 (1990). [4] S. Guéron, et. al., Phys. Rev. Lett. 77, 3025 (1996). [5] Y. Chai, et. al., IEEE Transactions on Electron Devices , 59, 1 (2012).

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