

Abstract Submitted  
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**Use of Abrikosov-Gorkov Density of State to Extract Spin Polarization at the Metal-Insulator Transition** R. V. A. SRIVASTAVA, W. TEIZER, Department of Physics, Texas A&M University, College Station, TX 77843-4242, USA — We have discovered and applied an analytical solution of the Abrikosov-Gorkov <sup>1</sup> density of states (DOS), describing superconductors with impurities, to extract the spin-polarization of 3-dimensional amorphous (a-)  $\text{Gd}_x\text{Si}_{1-x}$  in the quantum critical regime (QCR) of a magnetic field tunable metal-insulator transition (MIT). The analysis of the experimental spin-polarized (SP) tunneling conductance of an  $\text{Al}/\text{Al}_2\text{O}_3/\text{a-Gd}_x\text{Si}_{1-x}$  planar tunnel junction at  $T=25\text{mK}$  in parallel magnetic field  $H \leq 3.0\text{T}$  indicates a larger polarization near the MIT of a- $\text{Gd}_x\text{Si}_{1-x}$  ( $x=0.14$ ) as compared to previous work <sup>2</sup>, where a SP Bardeen-Cooper-Schrieffer DOS <sup>3</sup> was used. We will present polarization values at different applied magnetic fields in the QCR.

<sup>1</sup>A. A. Abrikosov and L. P. Gor'kov, Zh. Eksperim. I Teor. Fiz. 39, 1781 (1960).  
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<sup>2</sup> W. Teizer, F. Hellman, and R. C. Dynes. Phys. Rev. B 67, 121102 (2003).

<sup>3</sup> J. Bardeen, L. N. Cooper, and J. R. Schrieffer, Phys. Rev. 108, 1175 (1957).

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