

Abstract Submitted
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Fully - gapped anisotropic superconductivity robust against point - like disorder in FeSe single crystals.¹ SERAFIM TEKNOWIJOYO, KYUIL CHO, MAKARIY A. TANATAR, ANNA E. BOEHMER, SERGEY L. BUD'KO, PAUL C. CANFIELD, RUSLAN PROZOROV, Ames Laboratory, Ames, IA 50011, USA, OLIVIER CAVANI, Ecole Polytechnique, CNRS, CEA, Universit Paris-Saclay, 91128 Palaiseau Cedex, France, VIVEK MISHRA, University of Tennessee, Knoxville, Tennessee 37996, USA, PETER J. HIRSCHFELD, University of Florida, Gainesville, Florida 32611, USA — A highly anisotropic but finite superconducting gap is found in single crystals of FeSe by studying the London penetration depth $\lambda(T)$ measured down to 50 mK in samples before and after 2.5 MeV electron irradiation. The gap minimum increases with the introduced point-like disorder, indicating the absence of symmetry-imposed nodes. Surprisingly, the superconducting transition temperature T_c increases by 0.4 K from $T_{c0} \approx 8.8$ K while the structural transition temperature T_s decreases by 0.9 K from $T_{s0} \approx 91.2$ K after electron irradiation. We discuss several scenarios for the T_c enhancement and propose that local strengthening of the pair interaction by irradiation-induced Frenkel defects most likely explains the phenomenon.

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