Abstract Submitted for the MAR12 Meeting of The American Physical Society

London penetration depth in single crystals $SrFe_2(As_{0.65}P_{0.35})_2$ CHARLES P. STREHLOW, K. CHO, M.A. TANATAR, R. PROZOROV, Ames Laboratory, T. KOBAYASHI, S. MIASAKA, S. TAJIMA, Dept. of Physics, Osaka University, Osaka, Japan — In a contrast to a fully-gapped charge-doped $(Ba,K)Fe_2As_2$ and $Ba(Fe,T)_2As_2$ [1], isoelectron - substituted $BaFe_2(As,P)_2$ exhibit nodal superconducting gap [2]. To explore possible universality, low-temperature variation of the London penetration depth, $\Delta\lambda(T)$, was measured in optimally doped $SrFe_2(As_{0.65}P_{0.35})_2$ with $T_c=29$ K. $\Delta\lambda(T)$ revealed notable deviations from the exponential temperature dependence, expected for a fully-gapped superconductors. Instead the data are best fit with a power-law function, $\Delta\lambda = AT^n$. The analysis of the data below $1/3T_c$ over a variable fitting temperature range produced exponents $n \leq 2$ which suggests the presence of nodes in the superconducting gap, similar to the P - doped Ba122 compounds.

[1] R. Prozorov and V. G. Kogan, Rep. Prog. Phys. 74, 124505 (2011).

[2] K. Hashimoto, et. al. Phys. Rev. B 81, 220501(R) (2010).

Charles P. Strehlow Ames Laboratory

Date submitted: 13 Nov 2011

Electronic form version 1.4