Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Kerr Effect in Superconductor. SANG BOO NAM — A magnetic field H is to make the time reversal symmetry of the system be broken. Using the formulation [1], neglecting H dependence of Δ(T) and for the pair cyclotron frequency Ω = (2e/2m)H/c less than the photon frequency 2π c/λ, the Kerr angle is obtained as $\theta_{\mathrm{K}}(\mathrm{T}) = \theta_K(0)[\Delta(\mathrm{T})/\Delta(0)]\tanh\,[\Delta(\mathrm{T})/2k_B\mathrm{T}]$, where $\theta_{\mathrm{K}}(0) = \mathrm{A}\ \lambda^3\ \ \Omega$ / ($8\ \pi^3$ c N λ_L^2), A = (3λ/4, L)/ξ_{BCS} in the (non-local, local) limit, with mean free path length L and BCS coherence length $\xi_{BCS} = \hbar v_F/\pi\Delta(0)$. N = (n-1) n (n+1) with index of refraction n. For Sr2RuO4 [2], λ = 1550 nm, L = 1 μm, v_F = 100Km/s, n=3 and the London penetration depth length λ_L = 3 μm [3], T_C = 1.5 K . In the strong coupling case [4], $\Delta(0) = 2T_C$. The effective H is sum of the external applied and internal (by pair current) magnetic fields, to maintain the fluxoid quantization. After cooling a sample in the external magnetic field, turning it off, before warming a sample, is not necessary to make H vanish, since the pair current was set in a sample during cooling it. Then, H_{C2} = 750 Gauss [3], in the normal vortex core, is considered as H. With all values of parameters given above, we obtain $\theta_K(0)$ = (44, 38) nrad in the (non-local, local) limit in satisfactory agreement with data of 65nrad [2]. The fluxoid quantization makes the Kerr angle same within a range of the external applied magnetic fields. [1] Nam, PR. **156**, 470, 487 (67). [2] Xia et al., PRL. **97**, 167002 (06). [3] Mackenzie et al., RMP. **75**, 657 (2003). [4] Nam, PL. **A193**, 111 (94); (E) ibid**.** **A197**, 458 (95).

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Date submitted: 19 Nov 2007

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