Schneider and Keller Reply: In our Letter [1] we proposed a simple parabolic ansatz relating measured transition temperatures T_c to the corresponding zero temperature value of the squared inverse penetration depth $1/\lambda_{\parallel}^2(0)$. Our ansatz turned out to be in remarkable agreement with the available μSR data for a large variety of extreme type II superconductors including doped cuprates and Chevrel phase systems, as well as with the empirical generic trends in the T_c dependence of the isotope and pressure coefficients. In the meantime, however, it became clear that the ansatz might be valid only in the underdoped and mildly overdoped regime [2–5]. Our current understanding of its limitations is sketched in Fig. 1. Recent μSR measurements on overdoped $Tl_2Ba_2CuO_{6+\delta}$ [6,7], schematically represented by the long-dashed line, revealed, in contradiction to the parabolic ansatz (solid line), that $1/\lambda_{\parallel}^2(0)$ decreases in the overdoped regime with decreasing T_c. Accordingly, our simple ansatz and the resulting generic trends in the isotope and pressure coefficients still apply to the underdoped and mildly overdoped regime. In Fig. 1 we include the behavior of the attractive Hubbard model with particle-hole symmetry and strong coupling indicated by the short-dashed line [5]. In this regime the model describes an extreme type II superconductor. When particle-hole symmetry is broken the degeneracy of the underdoped and overdoped branch is lifted and the resulting behavior resembles the outline of a fly's wing [8], where the branch describing the underdoped model is close to our ansatz. The fact that a correlation between T_c and $1/\lambda_{\parallel}^2(0)$ has been established in a microscopic model system for type II superconductors, covering the full doping regime, strongly suggests that the observed correlation between T_c and $1/\lambda_{\parallel}^2(0)$ is an intrinsic feature of extreme type II superconductors and not an artifact of off-stoichiometric compounds with lower T_c and decreasing Meissner fraction, as proffered by Harshman and Fiory [9].

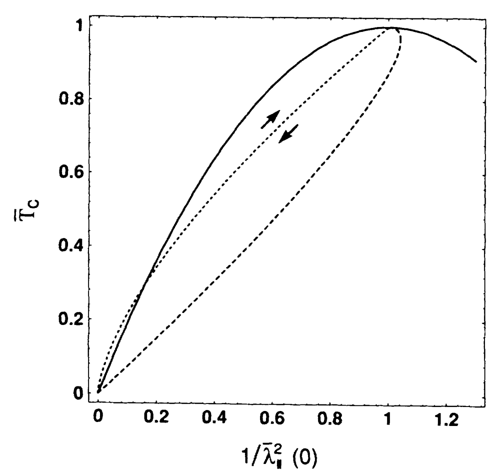

FIG. 1. Schematic plot of $\bar{T}_c$ versus $1/\bar{\lambda}_{\parallel}^2$ $(T=0)$; $\bar{T}_c$ and $\bar{\lambda}_{\parallel}(0)$ are the normalized transition temperature and penetration depth of a particular family of type II superconductors. The solid line refers to the underdoped and mildly overdoped regime of the parabolic ansatz; the short-dashed line sketches the behavior of the attractive Hubbard model with particle-hole symmetry in the strong coupling limit; the arrows mark the underdoped (arrow up) and the overdoped (arrow down) regimes; the long-dashed line illustrates the expected generic behavior of an overdoped system with broken particle-hole symmetry.

Furthermore, it is well documented that penetration depth values extracted from μSR relaxation rates ($\sigma \propto 1/\lambda_{\parallel}^2$) agree remarkably well with the estimates obtained from other experimental techniques on samples of various origin. Given these circumstances we conclude that the observed T_c versus $1/\lambda_{\parallel}^2(0)$ behavior is indeed an intrinsic property of extreme type II superconductors and not an artifact of sample quality nor of the particular experimental technique used to determine the penetration depth.

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