Keimer *et al.* Reply: We have recently reported a determination of the vortex lattice structure in $YBa_2Cu_3O_7$ in magnetic fields up to 5 T by high resolution small angle neutron scattering [1]. The vortex lattice is oblique, with an angle of $\beta = 73°$ between lattice vectors and lattice constants which are equal to within our experimental resolution. This structure had not been resolved in earlier low resolution measurements in lower fields [2]. By qualitatively adapting earlier theories for cubic superconductors, we noticed that such a structure would arise as a consequence of a fourfold coherence length anisotropy in sufficiently high magnetic fields. This conjecture has been substantiated recently by detailed calculations [3]; the question is at which field these core effects begin to become relevant. Since this question has thus far not been addressed by theory, we performed standard magnetic free energy calculations in the London model and found that the free energy becomes sensitive to the presence of the core in fields of several tesla. The details of the core cutoff are irrelevant for this qualitative observation. Of course, more elaborate calculations should be carried out in order to obtain an improved estimate of this "crossover field." Introducing an *ad hoc* smoothing of the core cutoff in the similarly simplistic calculation by Forgan and Lee [4], on the other hand, does not correctly address the physics of the core and in no way contradicts our conclusions. Rather, these authors merely reproduce the well-known result [5] that in an *isotropic* superconductor the vortex lattice is triangular at *all* fields, a result that is obviously not applicable to the cuprate superconductors.

The objective of the discussion in our paper was to stimulate a proper theory of the high field vortex lattice structure in the cuprates. It is gratifying to see that such calculations have now been carried out [3,6]. Together with our data, these models are beginning to provide a much improved basis for a theoretical understanding of the vortex lattice structure in the cuprates in intermediate to high magnetic fields. The predicted vortex lattice has a centered rectangular structure, in agreement with our observations. The nearest-neighbor direction is predicted to be the experimentally observed (110) direction only if $\beta = 90°$ [6], and an intrinsic origin of the (110) orientation of the observed ($\beta = 73°$) lattice is also conceivable [7]. However, the calculations also show that the orientational lock-in energy is very small [3]. It thus appears likely that extrinsic effects such as twin boundaries contribute at least partially to the observed vortex lattice orientation. The persistence of the vortex lattice orientation in tilted fields [8] remains puzzling and has thus far not been addressed by theory. The field dependence of the structure has also not been calculated, but the lack of substantial field dependence of the experimental data does not rule out core effects as the field range probed in our experiment is small on the scale of H_{c2}. We also pointed out the possible relevance of the in-plane penetration depth anisotropy of $YBa_2Cu_3O_7$ [1]. The magnitude of this anisotropy varies substantially from sample to sample, a phenomenon which has recently been traced to impurities disrupting the CuO chains in the $YBa_2Cu_3O_7$ structure [9]. Walker and Timusk [10] pointed out that our observations could be explained if the in-plane penetration depth anisotropy of our sample is comparable to that of the highest quality samples thus far investigated by transport techniques. A conclusive assessment of the relative importance of these two effects can only be obtained by further experiments.

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