Welp *et al.* Reply: The Comment [1] of Durán *et al.* provides flux images resolving individual twin boundaries (TB), which strongly support their original conclusion [2] that flux penetrates more easily along TB than in untwinned regions ("weak link" behavior). This conclusion is in contrast to the evidence we presented [3] that TB act as barriers to flux flow in the sample. In this Reply we present new images that resolve the apparent contradiction in the two pictures.

Figure 1 shows magnetic flux patterns in a $YBa_2Cu_3O_7$ crystal containing isolated twin boundaries at 20 and 40 K in a static field of 342 G. The crystal has been prepared so that the TB are parallel, perpendicular, or at an angle of 45° to the crystal edges. The observed patterns demonstrate directly that the flux behavior at the TB is determined by the relative direction of flux motion with respect to the TB and that these patterns are strongly temperature dependent. Flux motion parallel to the TB is probed at the upper and lower edges of the crystal. The observed "flame-shaped" flux patterns indicate that the TB act as weak links in which the transverse critical current is strongly reduced as compared to the bulk [4]. The degree of this reduction determines the long dimension of the flame. At low temperatures (top panel) the bulk critical current is large, effectively shielding the untwinned regions, and the flux penetration in the TBs is the dominant feature. At higher temperature (bottom panel), the bulk critical currents decreases drastically, and the flame pattern is less prominent. Here the barrier effect for flux motion at a finite angle to the TBs can be seen. The barrier appears as a finite step in intensity, most developed at the left edge of the crystal where the TBs are perpendicular to the flux motion. The rightmost TB shows the behavior at 45°: there is no weak link effect, and the barrier effect becomes visible at high temperature. The data in our earlier report [3] were taken at 63 K on TB oriented at 60° to the crystal edge. These conditions cause the TBs to act as barriers to flux motion.

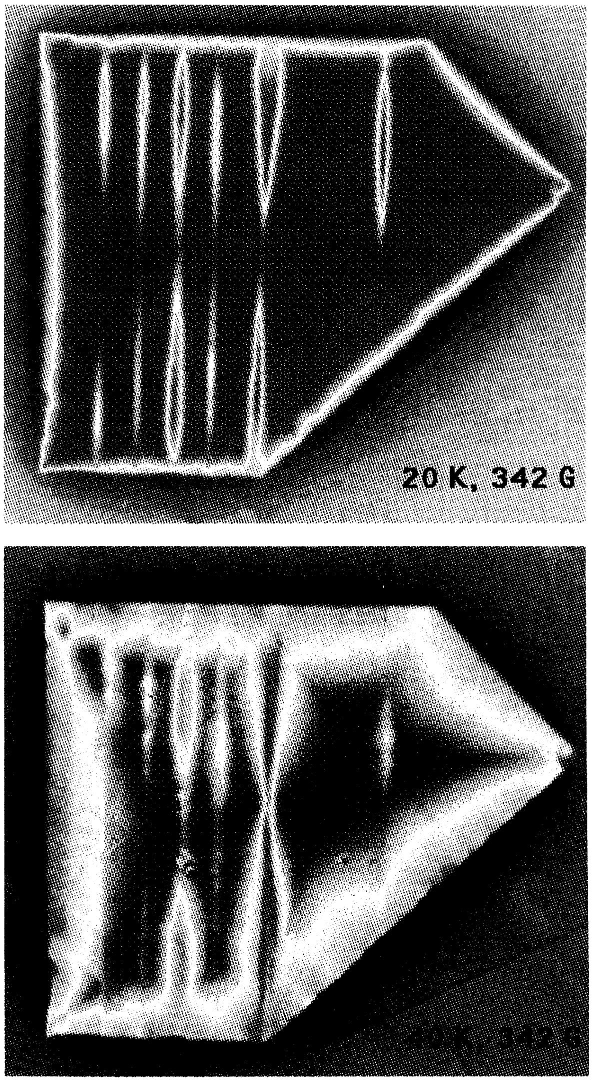

FIG. 1. Magnetic field patterns in a $YBa_2Cu_3O_7$ crystal with isolated twin boundaries in a static field of 342 G at temperatures of 20 and 40 K. Red symbolizes high field levels, blue low field levels. The crystal has a width of 600 μm.

Figure 1 shows that there is no contradiction between the weak link behavior first reported b Duran *et al.* [2] and the barrier behavior reported by us [3]. Rather, the two experiments reflect the qualitatively different behavior of TBs when the flux motion direction is parallel or transverse to the TB.

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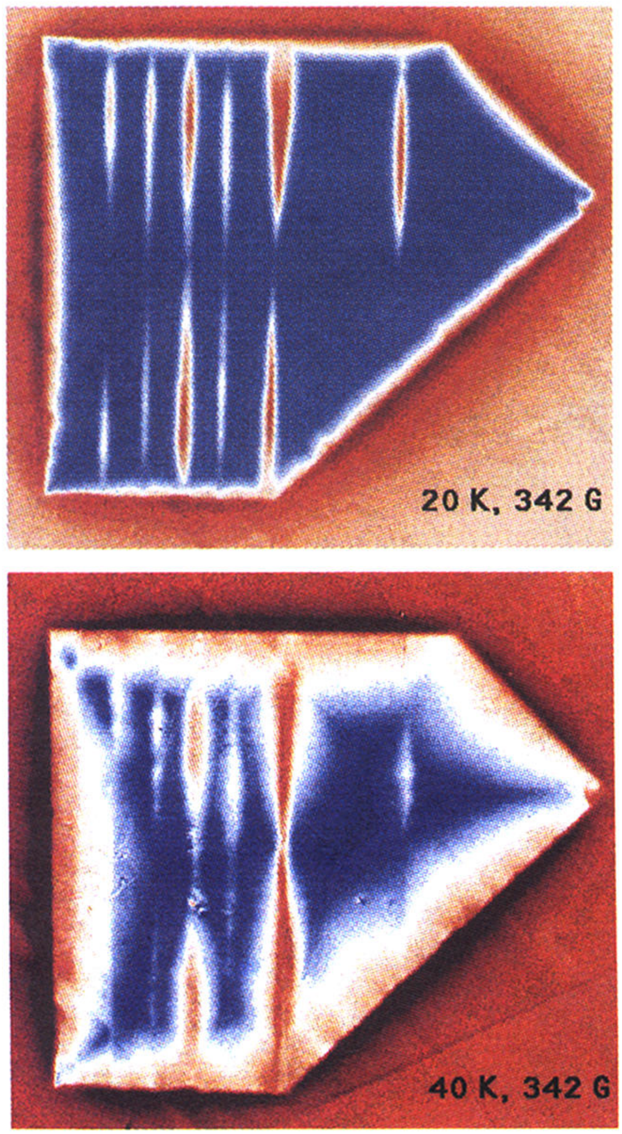

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