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Crossing fields in thin films of isotropic superconductors[1] F COLAUTO, UFSCar, V K VLASKO-VLASOV, ANL, A A BOUZDIN, U Bordeaux, A A M OLIVEIRA, IFSP, A M H ANDRADE, UFRGS, D CARMO, W A ORTIZ, UFSCar, D ROSENMAN, W -K KWOK, ANL — We study magnetic flux cutting effects by imaging the vortex dynamics in Nb films of different thickness in the crossing in-plane ($H_{||}$) and normal fields. For $H_{||}$ =1 kOe the motion of the normal vortices in a 200 nm film is found to be anisotropic. At $T>T_c/2$ we observe a delay in the vortex propagation across $H_{||}$. At $T<T_c/2$, when thermomagnetic instabilities occur, the vortex dendrites tilt perpendicular to the in-plane field direction. In a 100 nm film, the normal flux dynamics is isotropic and independent of $H_{||}$. Our calculations of the thermodynamic potential for the in-plane vortices predict their existence at $H_{||}$ =1 kOe only in the 200 nm film. In the 100 nm sample, $H_{||}$ monotonously changes through the film thickness. Therefore, the observed delay of the normal flux motion across $H_{||}$ in the thicker film is due to the vortex cutting-reconnection of the normal and in-plane vortices. The enhanced pinning potential for motion across $H_{||}$ explains also the tilt of the dendrite branches at $T<T_c/2$.

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