Crossing fields in thin films of isotropic superconductors$^1$ F CO-
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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 calcula-
tions 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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