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B7.8 THE EFFECT OF PRESSURE ON VOLUME AND SURFACE CRITICAL CURRENTS OF Nb. N.B.Brandt, E.Papp, and B.A.Ratnam. Moscow State University, Moscow, U.S.S.R.

The influence of hydrostatic pressures p up to 16 kbar on volume and surface critical currents of monocrystalline Nb in magnetic fields H and at temperature $T = 4.2^\circ \text{K}$ has been investigated. Harmonic analysis measurements were made at modulated (frequency $\nu = 120 \text{ c / sec}$, amplitude $h \sim 50 \text{ Oe}$) stationary (or sweep) H fields. Above H_{c2} , which monotonically decreases with p as $\sim 10 \text{ Oe / kbar}$, surface critical currents reversibly fall with p : at $p = 15 \text{ kbar}$ being $\sim 50\%$ lower. T_c up to $p = 16 \text{ kbar}$ is unchanged to within 0.1°K .

For sufficiently large h , 1st and 3rd harmonics as $f(H)$ exhibit minima (peak effect), whose positions, analogous to H_{c2} , decrease with p . Below H_{c2} the harmonics as $f(h)$ are close to zero for h less than a threshold and quadratic in h for h greater than the threshold. We identify this h threshold with a surface critical current, and the quadratic dependence with a volume flux penetration corresponding to the sample's volume critical current. Below H_{c2} this surface critical current decreases monotonically with H while the volume critical current exhibits a maximum. This suggests that the peak effect is determined by a volume flux penetration mechanism. The volume critical current is found to have a complicated p dependence.