FIG. 1. The shift in period, $\Delta P$, and dissipation $Q^{-1}$ are shown as a function of temperature at the superfluid transition.

Bishop, Reppy

Fig. 11.4.1 Behavior of the superfluid density with temperature. Note the discontinuity at $T = T_c$.

FIG. 3. Onset of superfluidity as a function of temperature. The points shown represent our results for three different substrates. (The point marked "Ne" was obtained with neon substrates over the Au and Al electrodes.) The dashed curve represents the limits between which past reported results lie. (Cf. Fig. 18 of Ref. 5.)
Kosterlitz-Thouless phase transitions

uniform state  vortex  anti-vortex

vortex-antivortex pair
Fig. 11.4.1 Behavior of the superfluid density with temperature. Note the discontinuity at $T = T_c$.

\[
\frac{m^2 k_B T_c}{\hbar^2 \rho_c(T_c)} = \frac{\pi}{2}
\]

Fig. 3. Results of all of our data, in addition to previous third-sound results for the discontinuous superfluid density jump $\rho_s(T_c)$ as a function of temperature. The solid line is the Kosterlitz-Thouless (Refs. 3 and 4) static theory.

Bishop, Reppy
RG flows in the $(K, y)$ plane. The transition temperature $T_c(y)$ is the straight line on the right ending at $K = \frac{2}{\pi}$.

\[
\frac{dK^{-1}}{dl} = 4\pi^3 y^2 + \mathcal{O}(y^4), \\
\frac{dy}{dl} = (2 - \pi K) y + \mathcal{O}(y^3).
\]

\[\text{II } C < 0, \quad 0 < t < 8\pi y_0\]
\[\text{III } C > 0, \quad t > 8\pi y_0\]
\[\text{I } C > 0, \quad t < 0\]