magnitude [8]. It can make the most noticeable contribution near θ_c, for the rotation of I_s is strongly hindered when this temperature is approached, as is evidenced by the strong growth of the coercive force in the region of θ_c [10]. It is possible that the small increase of ΔT (of negative sign) observed near θ_c (Fig. 1) is due to this cause.

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KONDO EFFECT AND SUPERCONDUCTIVITY

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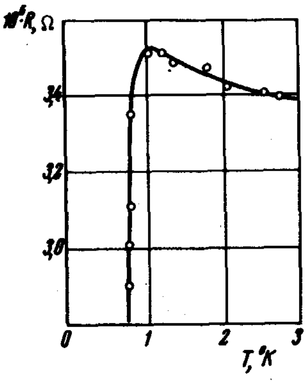
A recent paper [1] considers theoretically the interaction of conduction electrons with paramagnetic impurities in a superconductor.

One of the results of that paper is the statement of the possible coexistence of superconductivity and of the Kondo effect, which leads to the appearance of a minimum in the temperature dependence of the electric resistance.

Since the results of [1] are of basic significance in the understanding of possible factors affecting the superconductivity mechanisms, it is of interest to verify the foregoing statement experimentally.



We measured the electric resistance of molybdenum single crystals with very low iron impurity content (~2×10^{-4}%) in the temperature region 0.38 - 2.3°K (the low temperatures were obtained with the liquid He^3 apparatus designed by the authors of [2]). The measurement results are shown in the figure.

An increase of the electric resistance and a decrease of the temperature are observed up to the transition into the superconducting state. We did not study the inflence of the impurity concentration on the superconducting-transition temperature. This is treated in [3], where an accurate determination was made of T_c

for molybdenum samples of different purity, with allowance for the influence of the current flowing through the sample.

It can thus be regarded as established that an experimental situation is possible wherein the existence of a Kondo effect and of superconductivity are observed.

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THE NATURE OF THE QUANTUM OSCILLATIONS OBSERVED UPON PROPAGATION OF HELICONS IN A METAL

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The quantum-oscillation effects accompanying the propagation of helical magnetoplasma waves (helicons) in aluminum, indium, and in other metals were observed in a number of investigations [1,2].

A theory of this phenomenon was presented in [3] under the assumption that the effect is brought about by oscillations of the conductivity-tensor components. A result of the theory is that the oscillations occur predominantly in the damping of the helicons.

The experiments described in the present paper show that the effect calls for a different interpretation.

The measurements were made on single-crystal aluminum in the form of a disc of 10 mm diameter and 1 mm thickness, with a fourfold axis normal to the surface. The sample was placed in crossed coils. An audio-frequency signal was applied to one of the coils. The signal from the receiving coil was fed through a narrow-band amplifier and a synchronous detector to the y-coordinate of an x-y recorder. The constant magnetic field was measured with a Hall pickup. The measurements were made in fields up to 20 kOe. The inclination of the field to the surface of the sample could be varied by rotating the magnet.

Figure a shows the experimental plots of the resonance corresponding to excitation in the sample of a standing wave of length equal to double the thickness. Depending on the choice of the phase of the synchronous detector, one can record either the dispersion curve or the absorption curve. The curves reveal quantum oscillations whose amplitude increases appreciably with decreasing temperature. The priod of the oscillations corresponds to the sections of the tubes of the Fermi surface of aluminum in the third zone. Attention is called to the following feature: the amplitude of the oscillations has a minimum near the extrema of the curves. When the phase of the synchronous detector or the frequency of the excitation signal is changed, the extrema shift in the field and the position of the minima of the amplitude shifts with them. If the damping of the wave oscillates, i.e., the Q of the resonance, then there should be no fading of the oscillations at the extrema.

The effect can be explained by assuming that the wavelength oscillates. In order to verify this assumption, we performed the following experiment: