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DECAV OF TRAPPED-FLUX IN A SUPERCONDUCTING RING SUBJECTED TO IRRADIATION BY α-PARTICLES FROM A Po210 SOURCE

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We have measured how the trapped-flux in a Pb superconducting ring changes under a bombardment of α-particles. The experimental apparatus was as shown in fig. 1. The Po source had a thin gold layer covering the Po in order to fix it more effectively on its Pt backing. This source was prepared by us using electrolytic deposition of Po on a 10 mm diameter cylinder of Pt of height 5 mm. The activity of whole source was near 6 mC.

The lead ring was also obtained by electrolytic deposition. The thickness was 6 μ (measured and calculated).

The trapped-flux was nearly 48 maxwell (corresponding to nearly 60 gauss). The results of measurements are:

a. a decay of the trapped-flux as shown in fig. 2
   (in fig. 3 the same graph is drawn on a logarithmic scale); the time for the flux to reach half
   its initial value is about 14 hr,

b. when we again excited the magnetic field generating coil, the trapped-flux was again the same.
   Its value was not affected by preceding α-particle irradiation.

We repeated the measurement six times on this ring and two other times on another ring of different thickness and with a source of different activity, not having a thin gold layer between Po and lead as in other rings. As a check we did the measurements at the same time with the lead ring deposited on a platinum cylinder not irradiated.

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Fig. 1. Experimental apparatus.

Fig. 2. Decay of trapped-flux.

Fig. 3. Decay of trapped-flux in logarithmic scale.