P. de Feo and G. Sacerdoti: DECAY OF TRAPPED-FLUX IN A SUPERCONDUCTING RING SUBJECTED TO AN IRRADIATION OF $\alpha$ PARTICLES FROM A Po$^{210}$ SOURCE.

Nota interna: n° 161
26 Settembre 1962
P. de Feo and G. Sacerdoti: DECAY OF TRAPPED-FLUX IN A SUPERCONDUCTING RING SUBJECTED TO AN IRRADIATION OF \( \alpha \) PARTICLES FROM A \( {\rm Po}^{210} \) SOURCE.

We have measured how the trapped-flux in a Pb superconducting ring changes under a bombardment of \( \alpha \)-particles. The experiment has been suggested by G. Sacerdoti. The scheme of the experimental apparatus is 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 \( 6 \mu \) (calculated and measured).

The measurements of trapped-flux have been done by introducing the superconducting ring in the peak-up coil by moving up and down the holding stick.

The trapped-flux was nearly 48 Maxwell (corresponding to nearly 60 gauss). The results of measurements are:
a) the decay of the trapped-flux as shown in fig. 2. In fig. 3, the same graph is indicated on a logarithmic scale. The time for the flux to reach half its initial value is about 14 h;

b) when we again excited the magnetic field generating coil, the trapped flux was again the same. Its value was not affected by preceding $\alpha$-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 ring. As a check we did the measurements at the same time with lead ring deposited on a Platinum cylinder non irradiated.

We are now studying the possibility to detect with great sensibility the change of the trapped-flux by using a resonant cavity with Sacchetti, Balzam, Smriglio.

The authors thank Dr. Scaramuzzi and Dr. Modena for the helpful discussion and advices during the experiment.
FIG. 2 - Decay of trapped-flux.

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