



WARM-UP CHARACTERISTIC OF DOUBLER MAGNET

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Beginning at room temperature, RCB-80 was heated with a current of 10 amps dc for two hours. The magnet was horizontal in the test cryostat without vacuum. Thermocouples were placed in the bore on the coils to monitor temperature. The magnet voltage was measured to monitor the magnet resistance. The result is indicated in the graph.

$$\beta = \frac{\Delta R}{\Delta t} = 150 \text{ m}\Omega/\text{hr} \qquad R_0 = 4.8\Omega$$

$$\alpha = \frac{1}{R_0} \frac{\Delta R}{\Delta T} = 3.8 \cdot 10^{-3}/^\circ\text{F}^*$$

$$\frac{\Delta T}{\Delta t} = \frac{\beta}{\alpha R_0} = 8.3^\circ\text{F}/\text{hr}$$

The temperature measurement and the resistance measurement agree roughly. The room temperature warm-up rate of a Doubler magnet is $11 \pm 3^\circ\text{F}/\text{hr}$ at 10 amps.

*M. Kuchnir, J. L. Tague, Measurement of Resistance vs Temperature of 23 Strand Superconducting Cable, TM-679, 8/2/76

