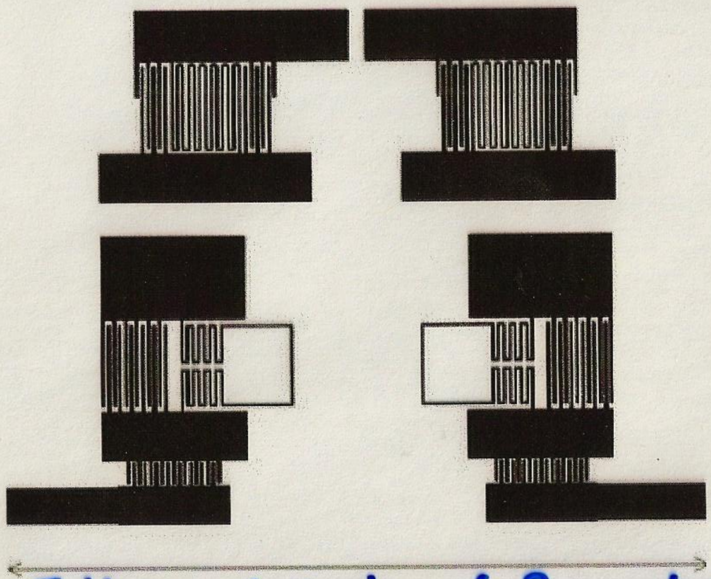
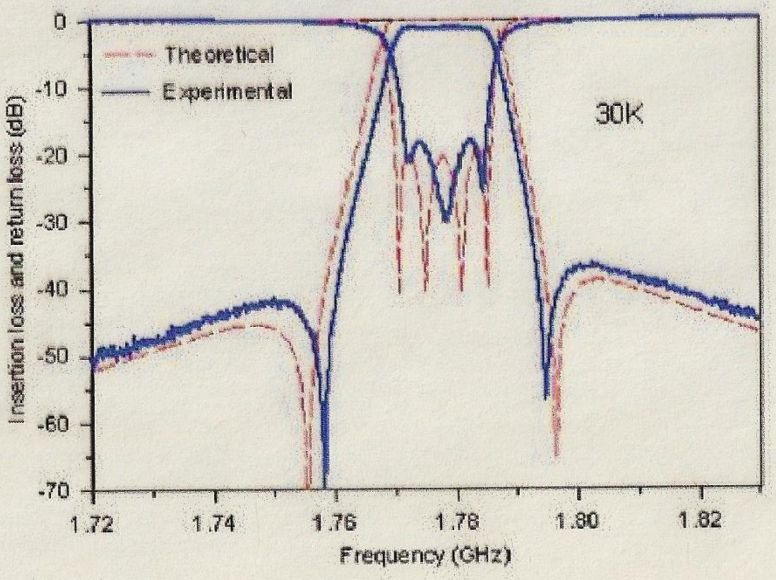
Superconducting Wireless Filters



Filter = Collection of Resonators



Picosecond pulses on superconducting striplines

R. L. Kautz 308 J. Appl. Phys. 49(1), January 1978

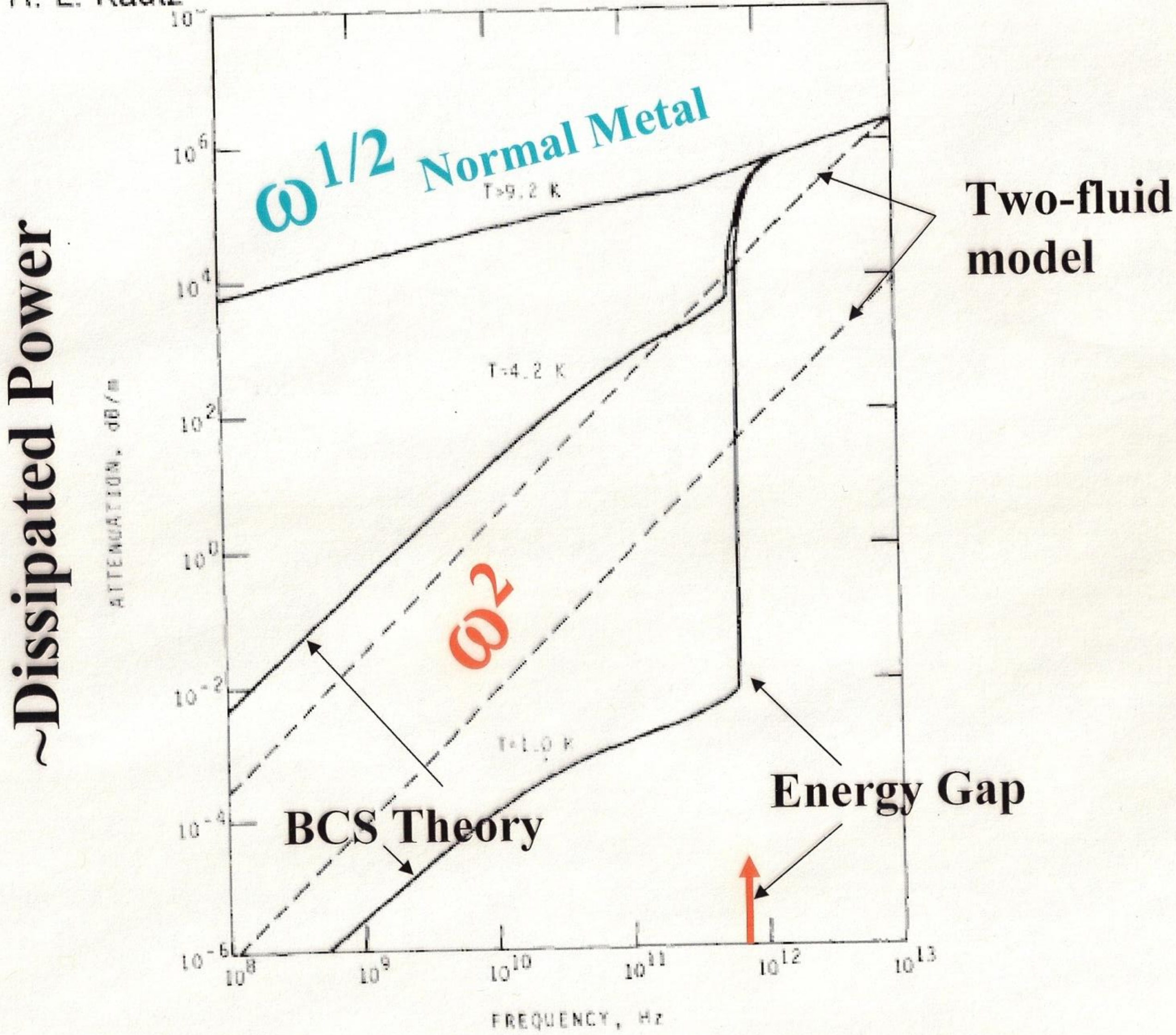
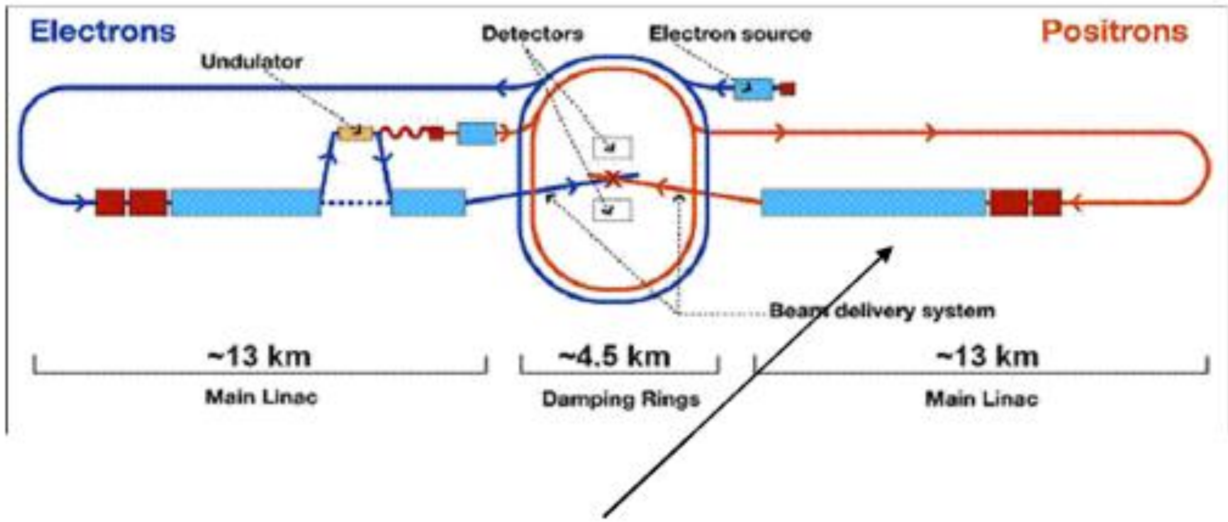


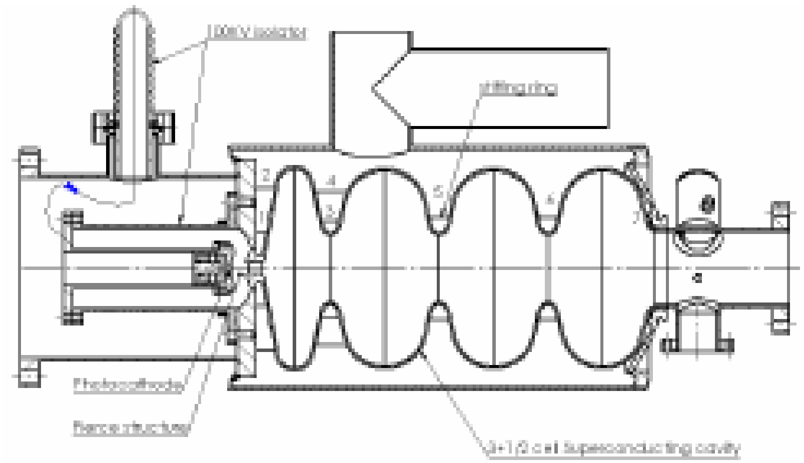
FIG. 2. Attenuation as a function of frequency for the example stripline. Solid lines are for the Mattis-Bardeen theory and dashed lines for the two-fluid model. For $T > 9.2$ K both conductors are normal and the two theories give the same result.

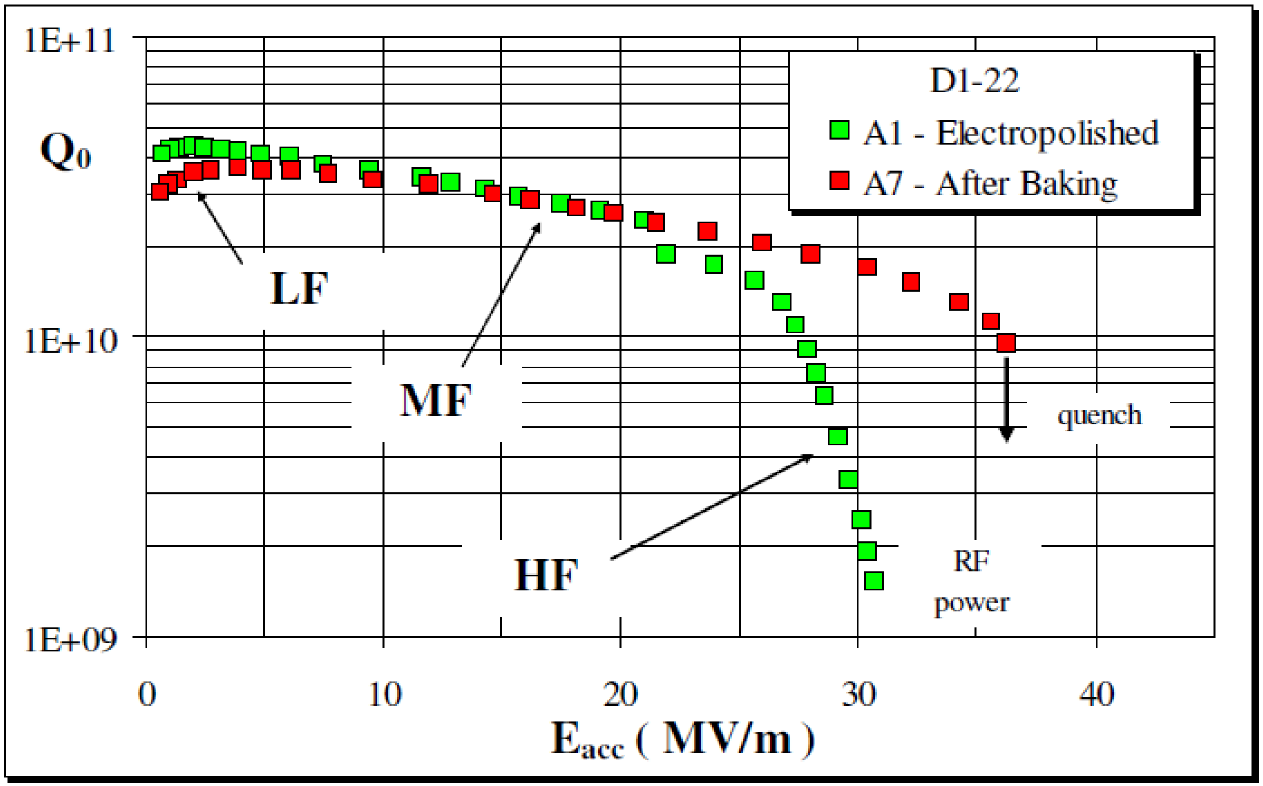
Superconducting Nb Radio Frequency Cavities for Particle Acceleration



ILC 16,000 cavities!

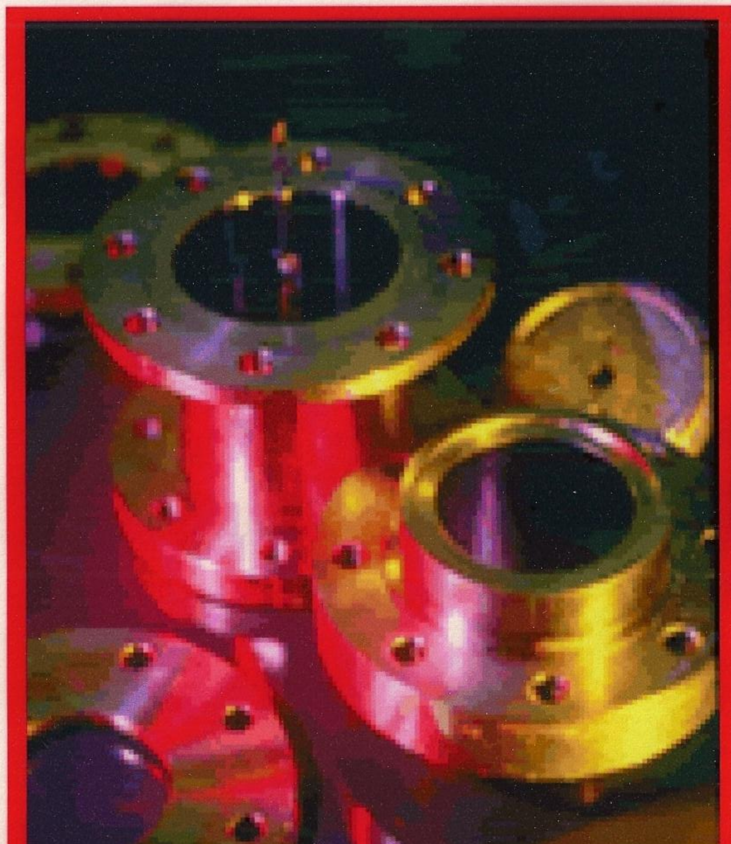
Superconducting Nb Radio Frequency Cavities for Particle Acceleration

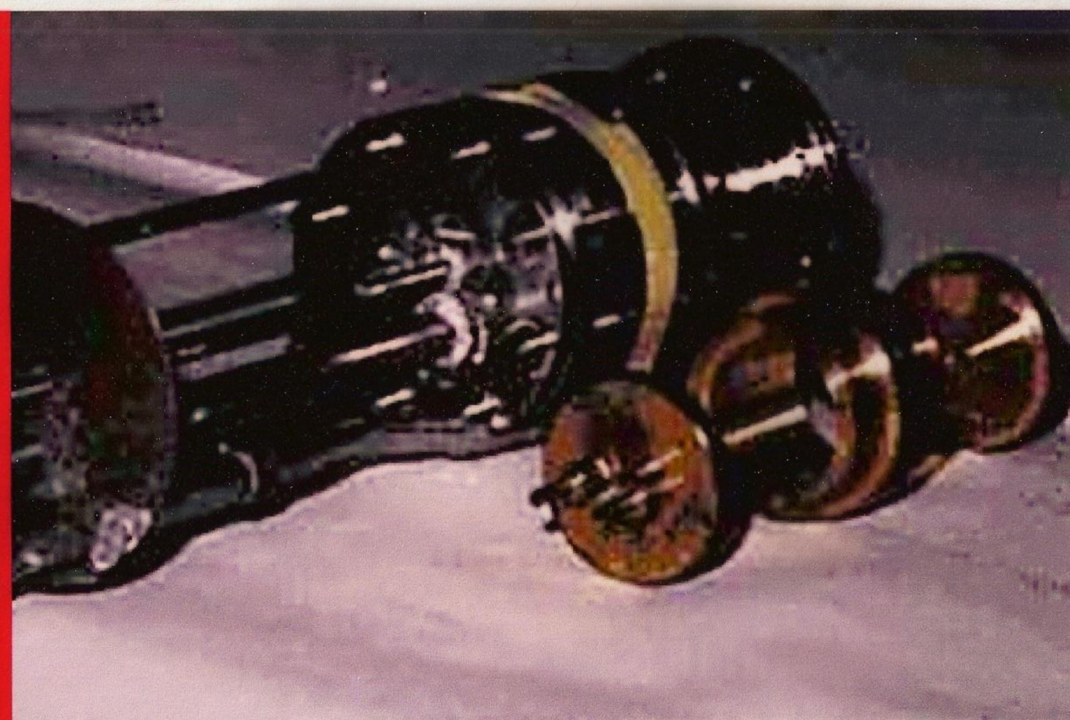


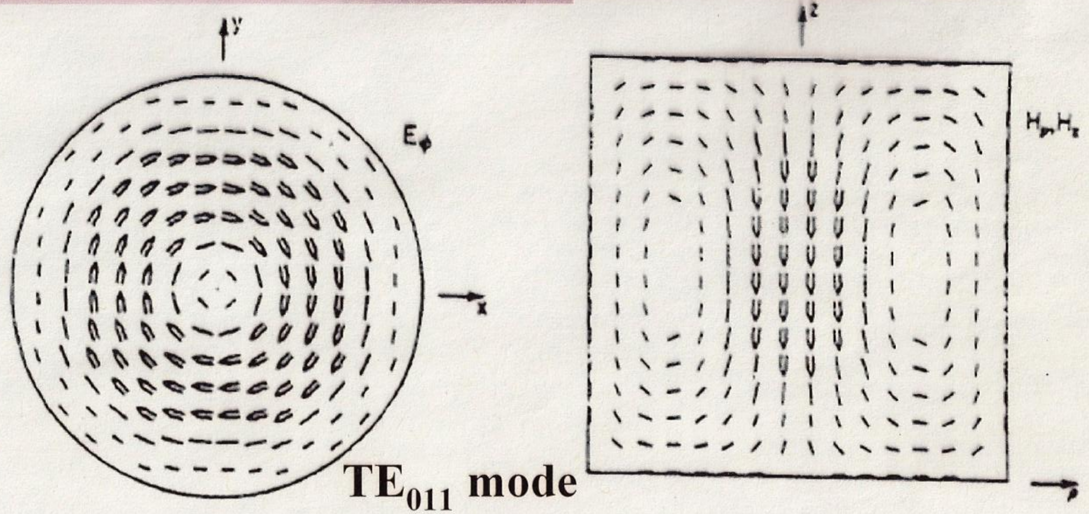


Superconducting Niobium Cylindrical Cavity

Anlage Lab

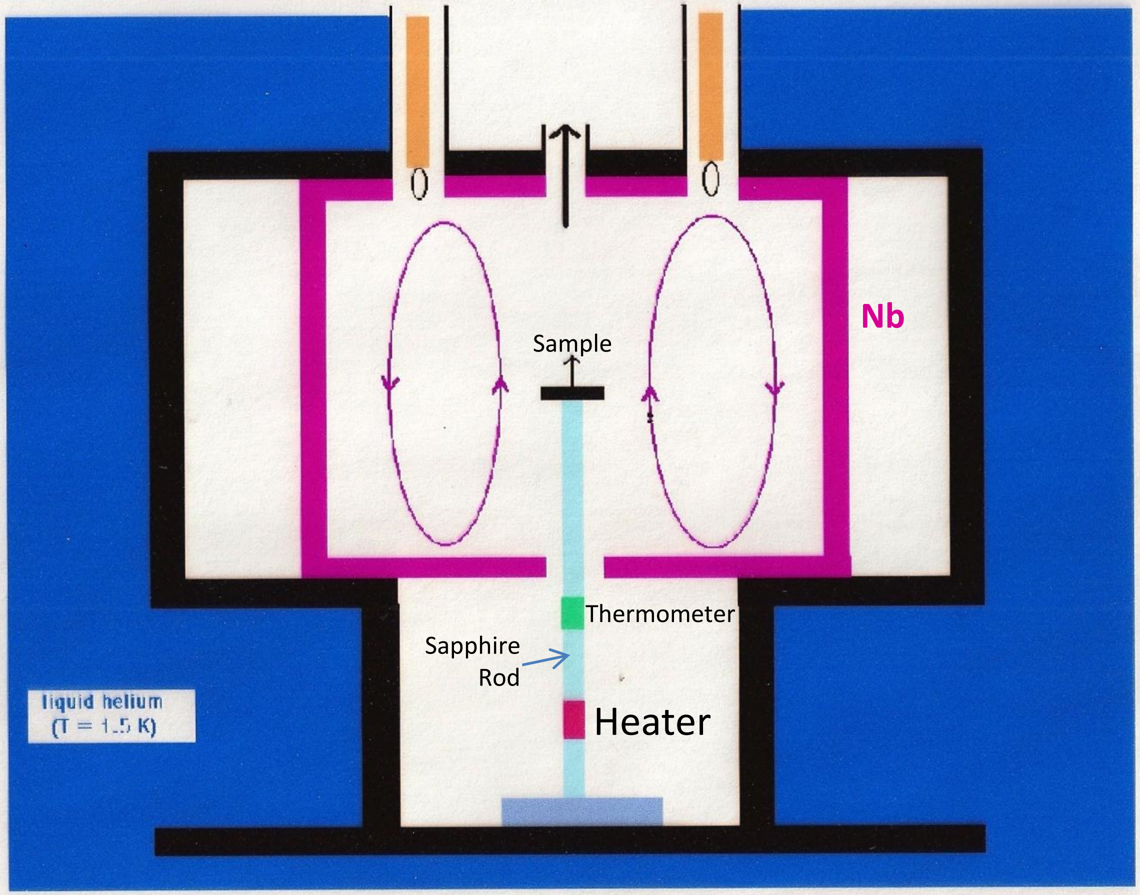






TE_{011} mode

Superconducting Nb Microwave Resonant Cavity



TE_{011}
f = 9.58 GHz
Q ~ 10^8 at 2 K

resonant frequency shift Δ f(T)

quality factor Q (T)

$$\Delta\lambda(T) = \left(\frac{\Gamma}{\mu_0\omega^2}\right)\{\Delta\omega_{sample}(T) - \Delta\omega_{backgnd}(T)\}$$

$$R_S(T) = \Gamma\left(\frac{1}{Q_{sample}(T)} - \frac{1}{Q_{backgnd}(T)}\right)$$