Project Assignment 3

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3. J. Bardeen, L. N. Cooper, and J. R. Schrieffer. Microscopic Theory of Superconductivity. Phys. Rev., 106(1):162–164, Apr 1957.
4. “BCS Theory and Superconductivity.” *University of Florida Physics*, University of Florida, [www.phys.ufl.edu/courses/phy4523/spring12/Sample%202.pdf](http://www.phys.ufl.edu/courses/phy4523/spring12/Sample%202.pdf).
5. Essén, Hanno, and Miguel C. N. Fiolhais. “Meissner Effect, Diamagnetism, and Classical Physics—a Review.” *American Journal of Physics*, vol. 80, no. 2, 2012, pp. 164–169., doi:10.1119/1.3662027.
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5) This paper is much more readable. It mostly seems to focus on classical interpretations of superconductivity and more specifically the Meissner effect. This paper mostly focuses of the finer points of the Meissner effect and how it can be explained classically. This paper mostly focuses on the macroscopic explanation of superconductivity. It suggests that large quantum mechanical systems create classical scenarios on the large scale. Therefore, superconductivity should also be able to be described in a classical framework.

In addition to explanations of the Meissner effect the paper also introduces theories and experiments that support the classical explanation. This classical explanation focuses heavily on the classical theory of electrodynamics and uses concepts that we are learning in class like magnetic flux. The Meissner effect is described by the expulsion of magnetic flux lines at the boundary of the superconductor. This paper introduces the math behind this concept.

6) There is not quite so much to say about this paper. It mostly talks about a consequence of the Meissner effect that many are familiar with. This floating magnet demonstration is what most people think of when they are first introduced to the concept of superconductivity. This paper is also much simpler than any of the previous papers and can be understood at a more elementary level. It also briefly discusses the demonstration but does not really offer much more than how it works on a basic level.