

Abstract Submitted  
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**Wave function for composite odd-frequency superconductors.**

HARI DAHAL, Los Alamos National Laboratory, ELIHU ABRAHAMS, Department of Physics and Astronomy, Rutgers University, DMITRY MOZYRSKY, Los Alamos National Laboratory, YUKIO TANAKA, Department of Applied Physics, Nagoya University, Japan, ALEXANDER BALATSKY, Los Alamos National Laboratory — Berezinskii proposed a new class of superconducting state that has an anomalous gap function that is odd function of frequency.<sup>1</sup> Following initial work of Berezinskii there has been growing interest in properties of such superconductors.<sup>2-3</sup> We propose a BCS-like wave function for an s-wave triplet odd-frequency superconductor. The wave function describes a condensate of spin-0 Cooper pair and spin-1 magnon; a composite order. By minimizing a Hamiltonian, suggested earlier in Ref. [3] to study the odd-frequency superconductor, we derive the quasiparticle dispersions, the self-consistent gap equation, and the density of states. We show that the quasiparticle excitations are gapless and the superconducting transition requires a critical coupling. References:

1. V. L. Berezinskii, JETP Lett. **20**, 287 (1974).
2. A. Balatsky, and E. Abrahams, PRB **45**, 13125 (1992).
3. E. Abrahams, A. Balatsky, D. J. Scalapino and J. R. Schrieffer, PRB **52**, 1271(1995).

Hari Dahal  
Los Alamos National Laboratory

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