Symmetry of the order parameter in non-centrosymmetric superconductors: Implementation for $CePt_3Si$ and $Cd_2Re_2O_7$ IVAN A. SERGIENKO, Department of Physics & Astronomy, The University of Tennessee, STEPHANIE H. CURNOE, Department of Physics & Physical Oceanography, Memorial University of Newfoundland — In noncentrosymmetric metals, the spin degeneracy of the electronic bands is lifted by spin-orbit coupling. We consider general symmetry properties of the pairing function $\Delta(k)$ in noncentrosymmetric superconductors with strong spin-orbit coupling (NSC). We find that $\Delta(k) = \chi(k)t(k)$, where $\chi(k)$ is an even function which transforms according to the irreducible representations of the crystallographic point group and t(k) is a model dependent phase factor. We consider tunnelling between a NSC and a conventional superconductor. It is found that, in terms of thermodynamical properties as well as the Josephson effect, the state of NSC resembles a singlet superconducting state with gap function $\chi(k)$. We propose the gap functions which may account for the experimental properties of the heavy fermion compound $CePt_3Si$ and the distorted pyrochlore $Cd_2Re_2O_7$.

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