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Variation of the extended s-wave superconducting order parameter: from s-wave to g-wave[1] HEESANG KIM, H. CHUNG, NAMMEE KIM, Department of Physics, Soongsil University — It has been reported that the existence of fermi surface nesting may lead to strong anisotropy of order parameter even in phonon-mediated superconductors such as YNi_2B_2C and $LuNi_2B_2C$. The strong $\hat{k}$-dependence may result in nodes as well, and yet the order parameter keeps the full rotational symmetry of the host metal in this case unlike the d-wave in the cuprates. This anisotropic order parameter transforms according to the totally symmetric representation in the group theoretical point of view, and can be classified as an s-wave. It is often called "an extended s-wave." $s + g$-wave order parameter, studied in connection with the non-magnetic borocarbides, is a good example of the extended s-wave. Here, the effect of variation of the gap anisotropy on superconducting properties of the $s+g$-wave superconductor is presenteded as a concrete example of the extended s-wave order parameter. Starting from an s-wave, and adding the g-wave component, we investigate the changing shape of the order parameter, evolution of the maximum and minimum of the gap, temperature dependence of the gap amplitude, the density of states, and the specific heat.

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