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External pressure effects on superfluid density of isotropic s-wave superconductors

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We investigated the effects of external pressure on the superfluid density of s-wave isotropic superconductors by the BCS theory and semi-classical approach. The analytic results obtained the equation of superfluid density with pressure variables involved were derived. After that, the derived equations were numerically calculated in used to predict the experimental results in the superfluid density of hydrogen sulfide(H3S) and Lanthanum decahydride(LaH10) superconductors. We found that when temperature rises, the superfluid density drops however, the superfluid density is highest near zero temperature.

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