

Pressure dependence of the thermodynamic critical field in francium

P.W. Pach,¹ R. Szcześniak,¹ and A.P. Durajski¹

¹*Czestochowa University of Technology,
Ave. Armii Krajowej 19, 42-200 Czestochowa, Poland*

In the paper, the values of the thermodynamic critical field (H_C) for francium have been calculated. It has been assumed the wide range of the pressure: $p \in \langle 9, 14 \rangle$ GPa. The analysis has been performed in the framework of the strong-coupling formalism. It has been predicted that the value of the ratio $H_C(0) / \sqrt{\rho(0)}$ increases with the increasing pressure from 3.81 meV to 5.84 meV, where $\rho(0)$ denotes the electron density of states at the Fermi level. The dimensionless parameter $T_C C^N(T_C) / H_C^2(0)$ is smaller than in the BCS theory and decreases with pressure from 0.147 to 0.141. The symbol T_C represents the critical temperature and C^N is the specific heat for the normal state.