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Plasmon mechanism of superconductivity

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Using the estimate of the characteristic length by the Heisenberg's uncertainty principle and the WKB method, the relationship between the London penetration length and the coherence length for HTSC is obtained. The relationship between the London penetration length and the wavelength of plasma oscillations is considered, on the basis of which an expression is obtained for the velocity of a Cooper pair and the critical temperature of HTSC in the plasmon mechanism of superconductivity. The calculated values of critical temperatures were checked for compliance with the experimental data for the cuprate, organic and other superconductors, good agreement was obtained.

Primary author: Mr MATASOV, Anton (National Research University "Moscow Power Engineering Institute")

Presenter: Mr MATASOV, Anton (National Research University "Moscow Power Engineering Institute")

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