

Giant Vortex States in a Long Superconducting Cylinder with a Hole in Center

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Abstract: We have theoretically studied the nucleation of superconductivity in doubly connected superconductors in the form of long superconducting cylinders. The giant vortex states are investigated with the nonlinear Ginzburg-Landau theory. The solutions of Ginzburg-Landau equations are solved numerically with relaxation method. The quantum size effect is clearly shown through the calculation of free energy.

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Key words: giant vortex states, Ginzburg-Landau equations, size effect

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