

Abstract Submitted
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Size, Shape and Impurity Effects on Superconducting critical temperature.¹ MASAKI UMEDA, MASARU KATO, Osaka Prefecture University, OSAMU SATO, Osaka Prefecture University Colledge of technology — Bulk superconductors have their own critical temperatures T_c . However, for a nano-structured superconductor, T_c depends on size and shape of the superconductor [1]. Nishizaki showed that the high pressure torsion on bulks of Nb makes T_c higher, because the torsion makes many nano-sized fine grains in the bulks [2]. However the high pressure torsion on bulks of V makes T_c lower, and Nishizaki discussed that the decrease of T_c is caused by impurities in the bulks of V. We studied size, shape, and impurity effects on T_c , by solving the Gor'kov equations, using the finite element method. We found that smaller and narrower superconductors show higher T_c . We found how size and shape affects T_c by studying spacial order parameter distributions and quasi-particle eigen-energies [3]. Also we studied the impurity effects on T_c , and found that T_c decreases with increase of scattering rate by impurities. [1] H. Suematsu, M. Kato and T. Ishida, J. Phys.: Conf. Ser. 150 (2009) 052250. [2] T. Nishizaki et al., Physica C 493 (2013) 132. [3] M. Umeda, M. Kato, O.Sato IEEE Trans. Appl. Supercond. 26 (2016) 8600104.

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