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Magnetic flux structures and superconducting structures in nano-sized polygon superconducting plates MASARU KATO, Osaka Prefecture Univ, OSAMU SATO, Osaka Prefecture Univ. College of Technology — Vortex structures in nano-sized superconductors under an external field have been studied for decades. It was shown that vortices in square superconducting plates are different from those in bulk superconductors. The vortices are affected by the shielding current at edges of superconductors. Therefore the vortex structure depends on the shape of the superconductor. We recently studied the vortex structures in a pentagon superconducting plate at low temperature and showed how vortex structures change with increasing the magnetic field. These structures agree with the experiment by Ishida et al. [1]. In this study, we investigate the vortex structures around the transition temperature in various polygon superconducting plates under the external field. For this purpose we solve the Ginzburg-Landau (GL) equations, especially linearized GL equations, using the finite element method. We show the relation between shapes of superconductors and vortex structures and superconducting order parameter structures. [1] T. H. Huy, M. Kato, T. Ishida, *Supercond. Sci. Technol.* 26 (2013) 065001.

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