1003-65-400   **Bongsoo Jang*** (`bsjang@uncc.edu`), Dept of Math and Stat, 9201 University City Blvd, Charlotte, NC 28223, and **Haesoo Oh** (`hso@uncc.edu`), Dept of Math and Stat, 9201 University City Blvd, Charlotte, NC 28223. *The Finite Element Method for Elliptic Problems with a highly oscillating coefficient containing singularities.*

We study the finite element method for elliptic boundary value problems in a highly oscillating coefficient containing singularities. It is difficult to have a numerical approximation for these problems because of the presence of rapidly oscillating coefficients and singularities. To overcome these difficulties, we use two methods, the homogenization method and the auxiliary mapping method. The first method is replaced by an equation with non-oscillatory coefficients and it reduces computation costs. the second method (MAM) developed by Babuska and Oh, can be effectively handle singularities in the frame work of the p-version of the finite element method. the combining numerical method is illustrated with several examples. (Received September 30, 2004)