# *Διπλωματική εργασία*

## *Θέμα: Προσδιορισμός της τάσης και της παραμόρφωσης σε ένα σύστημα μήτρας ενδόθετου*

## Abstract

This thesis is divided into two parts. In the first part, the theoretical calculation of the maximum and minimum strain field of a quantum wire in a matrix is presented in three different ways. Two of the three methods, which belong to the category of continuum medium methods, are 1) the boundary element method (BEM) and 2) the inclusion method. The third method is based on (individual approach: atomic approach) and simulation: 3) the molecular static one. The results of the three methods are compared and qualitative and quantitative conclusions are drawn. In the second part, the strain and stress of six different inclusion matrix systems are calculated employing MATLAB and methods of continuum medium. The matrix is given various external loads for different geometries of inclusion. For each application, a three-dimensional representation of the field along with comparisons of the strain and stress variations due to the change of the geometric characteristics of the inclusion are being performed, as well as comparisons of the fields that result from different combinations of matrix and inclusion materials.

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