Abstract:

Even after more than three decades of intensive research in the field of contact mechanics, there is still a great need for improving the numerical methods. Recent investigations on the 2D Hertzian contact problem clearly showed significantly varying results for different finite element versions. In this paper we will compare the analytical solution of the 2D Hertzian contact problem with the numerical results of the classical h-version with uniform and locally refined meshes, as well as with the p-, the hp-, and the rp-version of the FEM. The penalty method is used to incorporate the contact constraints.

Stichworte:

Contact, Penalty method, Higher order, Adaptivity, Nonlinear