

1011-65-8

Weimin Han* (whan@math.uiowa.edu), Department of Mathematics, University of Iowa, Iowa City, IA 52242. *Finite Element Analysis of Quasistatic Variational Inequalities with Applications in Elastoplasticity and Contact Mechanics.*

The talk is on a family of quasistatic variational inequalities arising in elastoplasticity and contact mechanics. We show existence and uniqueness of solutions of the variational inequalities. We introduce semi-discrete and fully discrete numerical methods for solving the inequalities and present optimal order error estimates. We also provide a posteriori error estimates and adaptive solution algorithms for solving the variational inequalities. (Received March 27, 2005)