סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה׳ 27.10.16 (כה׳ בתשרי, תשע״ז), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 14:30.

ירצה:	ירון בן שמואל
מנחה:	פרופ׳ אלי אלטוס

על הנושא:

Modeling plasticity by non-continuous deformation

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

Plasticity and failure theories are still subjects of intense research. Engineering constitutive models on the macroscale which are based on micro characteristics are very much in need. This study is motivated by the observation that continuum assumptions in plasticity in which neighbour material elements are inseparable at all-time are physically impossible, since local detachments, slips and neighbour switching must operate, i.e., Non-Continuous Deformation (NCD).

Material microstructure is modelled herein by a set of point elements (particles) interacting with their neighbours. Each particle can detach from and/or attach with its neighbours during deformation. Simulations on two dimensional configurations subjected to uniaxial compression cycle are conducted. Stochastic heterogeneity is controlled by a single "disorder" parameter.

It was found that a.) Macro response resembles typical elasto-plastic behaviour; b.) Plastic energy is proportional to the number of detachments; c.) Residual plastic strain is proportional to the number of attachments, and d.) Volume is preserved, which is consistent with macro plastic deformation. Rigid body displacements of local groups of elements are also observed.

Higher disorder decreases the macro elastic moduli and increases plastic energy. Evolution of anisotropic effects is obtained with no additional parameters.

In order to correlate between microscale morphology and macro material parameters, an affine assumption was adopted. It was found that the macro elastic tensor is proportional to the 4th rank fabric tensor with some limitations which will be discussed.

The research is currently focused on generalizing the micro-macro relations to non-affine-approximations.

בברכה,

פרופ׳/א אמיר פֿם

מרכז הסמינרים