סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה' 7.11.2019 (ט' בחשון, תש"פ), בניין דן קאהן, אודיטוריום 1, 13:45.

מרצה: פז בן אברהם

מנחה: פרופ'/ח דן מרדכי

על הנושא:

Edge Dislocation Motion in Molecular Dynamics Simulations of Au

The seminar will be given in Hebrew

תקציר ההרצאה:

Plastic response of materials are governed by dislocations motion inside the material. In order to develop multiscale models for plasticity in metals, dislocations kinematics should be better quantified. Using Molecular Dynamics (MD) simulations, we studied the dynamic behavior of a moving dissociated edge dislocation in a large range of velocities. Beginning with two dislocations in a dipole structure in bulk systems, we studied a single dissociated edge .3dislocation motion under high stress levels. We quantified the dislocation velocity approaching and overpassing the shear sound velocity of the material. The result is similar to what was previously observed in other metals. However, when a dislocation glide near a free surface, we observed that its subsonic velocity is limited by a velocity lower than the shear sound velocity. In addition, we have found that the dissociation width depends on the gliding velocity. To understand these phenomena, we applied the anisotropic elasticity theory of gliding dislocations to a dissociated edge dislocation. We show that dislocation glide affects the stress field around it, leading to a dissociated width change while gliding. Moreover, free surface around the dislocation adds constraints to the stress field, resulting in different limiting velocity, related to the Rayleigh wave velocity rather than the shear sound velocity. Finally, we compare between the dynamic displacement fields generated in the MD simulations and the elastic model and discuss its limitations.

בברכה,

פרופ"א מתי סאס

מרכז הסמינרים