סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה׳ 17.09.15 (ד׳ בתשרי, תשע״ו), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

ירצה : שגיא שיינקמן

מנחה : פרופ״מ דן מרדכי

על הנושא:

The Collective Effect of a Dislocation Network on their Climb Rate

להלן תקציר ההרצאה:

One of the great challenges in solid mechanics is to prevent the degradation in strength of components. In particular, at high temperatures material may deform even at low constant stresses, a deformation mode known as deformation creep. One of microstructural mechanisms that control deformation creep is dislocation climb – a dislocation motion due to absorption or emission of vacancies. Therefore, reliable dislocation climb models, which couple diffusion of vacancies and dislocation motion, are essential to understand how to control mechanical properties in creep conditions. In most climb models, the dislocation network is assumed to be homogeneous and dilute, which allow treating each dislocation as isolated. However, this assumption is far from being true in cases such as in dislocation dipoles, dislocation pile ups, dislocation walls, etc. In this study we developed a climb model that accounts for the collective effect of the dislocation network in dense dislocation structures. The diffusion equation of vacancies is solved in a region of a general dislocation network. The model is then applied to certain dislocation structures. We extend the definition of the sink strength to account for the coordinated terms in the climb rate, and we show that the vacancy field is distributed between the dislocations in the network according to their relative position. It helps understanding the way metals deform in creep conditions with more realistic dislocation structures. Finally, we discuss the importance of our results on modeling deformation creep.

בברכה,

פרופ׳/מ אמיר לׄת

מרכז הסמינרים