

סמינריון

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ד' 22.12.21 (י"ח בטבת, התשפ"ב), בשעה 11:00 באמצעות הזום <https://technion.zoom.us/j/92340988781>

מרצה : בת שבע ליידרמן

מנחה : פרופ' דן מרדכי

על הנושא :

Voids growth in liquid lead in spallation

The seminar will be given in Hebrew

תקציר ההרצאה :

Spall is a local fracture induced by tensile stresses, during which microvoids nucleate, grow and finally coalesce to a fracture plane known as spall. This process is of multiscale nature, starting from nucleation of voids at the atomic level, and their growth and coalescence at the meso and macroscale level. Therefore, having multiscale model of the behavior controlling spallation is essential to have physical models to predict damage at high strain rates. In this work, we focus on the growth of embryonic voids by studying two dimensional simulations of a single void growth in liquid lead, as a first stage towards developing a multiscale model for spallation. First, we introduced small voids in molecular dynamic (MD) simulations of liquid lead and measured their change of size under different pressures. Then, with an eye towards a physical model for void growth, we developed an analytical model based on the Rayleigh-Plesset model for describing viscous void growth in two dimensions. The analytical model includes three material parameters - viscosity, density and surface energy, which are obtained both from the MD simulation or experimental results. The analytical model, with the calculated material parameters, are found to have a good fit with the MD simulations of void growth for different voids' initial radii and pressures by applying Tolman correction for primary small voids. The analysis of a single void will be used in further studies of multiple voids nature, under spallation process, as a part of a multiscale model formulation.

בברכה,

פרופ' דן מרדכי

מרכז סמינרים