סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 30.07.2020
(ט' באב תש"פ), בשעה 13:30 באמצעות הזום :

https://us04web.zoom.us/j/73489287572?pwd=ZG5MUFplQ2xURU1VaHlVVm93SVp2dz09

Meeting ID: 734 8928 7572
Passcode: 1RMARH

מרצה : אסף מזרחי
מנחה : פרופ' דורון שילה
מנחה שותף : ד"ר אילון פארן

על הנושא:

Studying deformation processes at high strain rates using a unique under-microscope mechanical pulse system

The seminar will be given in Hebrew

תקציר ההרצאה :

We present a miniature experimental system that allows real time optical observation of deformation processes in materials. The system can apply controllable force pulses with strain rates of up to 2000 s^{-1}. The capabilities of the method for studying deformation mechanisms are demonstrated by visualization of stress-induced twinning reorientation in Ni-Mn-Ga under different strain rates. In addition, the proposed method allows obtaining velocity-stress relations for individual twin boundaries, which suggest that twin boundary velocity is determined not only by a kinetic relation but also by local interactions with other defects. This behavior is further quantified by performing a statistical analysis on a data set of more than 400 twin boundary velocity values that is acquired using the presented setup. Insights regarding the differences between the dynamics of type I and type II twins in Ni-Mn-Ga are revealed, and in particular help to explain the large differences in maximal velocities reported previously for type II twin boundary. The obtained statistical data can improve the design and modeling of MSM actuators. The presented system will be used for future investigation of deformation processes in other material systems, e.g., non-modulated Ni-Mn-Ga and pure Mg single crystals.

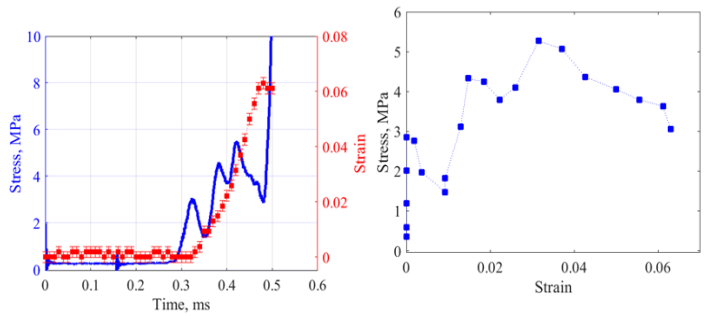

Figure 1 (a) Stress-time profile (blue) and strain-time profile (red) measured during a typical force pulse experiment. (b) Dynamic stress strain curve of Ni-Mn-Ga sample measured under a force pulse at an average strain rate of 450 s^{-1}.

בברכה,

פרופ"א אתי טאס
מרכז הסמינרים