הטכניון – מכון טכנולוגי לישראל

הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 27.08.15 (יב' באלול, תשע"ה), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

ירצה: יהב מושקוביץ
מנחה: פרופ"ח נתאי דרימר

על הנושא:

A design method for planing hulls, considering hydro-elasticity and nonlinear dynamic structural response

להלן תקציר ההרצאה:

Planing is the most common concept of fast boats. Planing vessels are used for patrol, intercept, rescue, racing, recreational, fishing, workboats, and recently unmanned boats. The dominant load for the hull design of planing boats is typically applied by water impact at head seas. The high impact pressure while entering the water, known as slamming pressure, is related to sudden acceleration of the water by the new contact with the hull.

Applied rules for the design of planing boats, LR (2014), DNV (2014), ABS (2014), RINA (2009), assess the strength of the hull structure by applying to the shell a quasi-static pressure. The pressure is calculated by an empirical formula that assesses the slamming pressure at the design service conditions. The boat is represented by a set of geometrical and mass parameters, while the service conditions are defined by the boat speed and the significant wave height (average of the highest one third of the waves in a record, during a period where a stationary wave spectrum is assumed).

This research offers a design method for the hull structure of planing vessels, which considers dynamics, hydro-elasticity and nonlinear structural effects (geometry and material). This approach may lead to more efficient design, with thinner bottom plates and wider spans between stiffeners, hence reducing the hull weight and the length of welding seams. Our method combines rules, theoretical solutions and numerical analysis to a practical design procedure.

The numerical analysis based on commercial code ABAQUS/CAE with Arbitrary Lagrangian–Eulerian (ALE) formulation for the fluid domain and Lagrangian formulation for the structure domain.

בברכה,

פרופ'/מ אמיר גת

מרכז הסמינרים