

Faculty of Maritime Engineering and Marine Sciences

Ship Dynamics

Course project: Ship response to irregular seas

Aug.17th, 2023

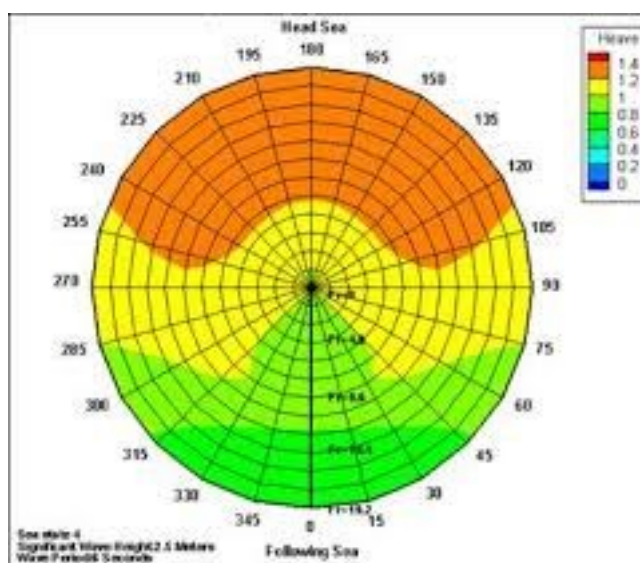
Team work:

Objective: To evaluate the response of a particular ship selected by each team, in irregular seas and in different navigational situations.

Calculations: Each team selects a ship and prepares the lines plan in Rhino format. This plan is to be imported from MaxSurf, as was explained in class, to develop the required ship motion calculations. Also with these lines, you may develop any hydrostatic calculations required to calculate dynamic response.

Using the module `Motions` from MaxSurf computer software, calculate ship response parameters according to the evaluation of your particular design. For operational parameters, consider variation of: ship velocity (at least 3 values), sea state levels 4 and 5, load conditions (at least two: full and 50% of consumables). You have to consider incoming waves from different directions (0-180° with increments of 30° and use the symmetry).

With the results you have first to develop simple calculations to check that they indeed correspond to the case analyzed. For example, resonant conditions with quick estimations of natural frequencies, or, response for limit values, etc. Then you proceed to evaluate the response of the ship in irregular seas, according to its mission. You have to use at least three parameters, and results of the analysis have to be summarized in graphs presenting regions of parameter levels according to the incoming wave direction and velocity of the ship. See attached figure.



Report: It must be written in English, maximum 6 pages long, Times New Roman 11 type, in the previously employed format. It will be evaluated as per: aesthetics of the report (25%), theoretical development and research (30%), and, result analysis, achievement of objectives, conclusions and recommendations (45%).

Project evaluation: The written report represents 65% of the grade, while oral presentation, 35%.

Progress control: Thursday 17th: ship hydrostatics; Monday 21st: regular waves response (using MaxSurf), Thurs24th: selection of parameters to be analyzed and irregular ship response. Some groups will be randomly selected to present their progress in the XXX NESTS, Aug. 23rd.

Deadlines: in-person oral presentation including printed report for 8 am Monday Aug. 29th.