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Fuzzy Monte Carlo method for probability of capsizing calculation using regular and non-regular wave

Summary

Currently, research centers from all over the world (Italy, Greece, Japan, USA, Germany) are working on new generation of stability regulations. IMO proposed to focus on three main scenarios of ship capsizing. One of these scenarios refers to Dead Ship Condition. The new regulations are to be of probabilistic nature. To achieve it, it will be necessary to create the appropriate methods of determine the probability of ship capsizing or the probability of loss of stability accident (LOSA).

In order to calculate the risk of ship capsizing it is necessary to build a mathematical model of ship motion. One of exiting model is called LAIDYN, which was developed at Aalto University in Espoo, Finland.

In this article one of method used to assess the LOSA probability is presented. This method is based on the Monte Carlo simulation with fuzzy number method application. In ship's motion model both regular and irregular waves are considered.

Key words: *capsizing, dead ship condition, Monte Carlo*