Ginzburg-Landau equation as a heuristic model for generating rogue waves

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Envelope equations have many applications in the study of physical systems. Particularly interesting is the case 0f surface water waves. In steady conditions, laboratory experiments are carried out for multiple purposes either for researches or for practical problems. In both cases envelope equations are useful for understanding qualitative and quantitative results. The Ginzburg-Landau equation provides an excellent model for systems of that kind with remarkable patterns.

Taking into account the above paragraph the main aim of our work is to generate waves in a water tank with almost a symmetric spectrum according to Akhmediev (2011) and thus, to produce a succession of rogue waves. The envelope of these waves gives us some patterns whose model is a type of Ginzburg-Landau equation, Danilov et al (1988). From a heuristic point of view the link between the experiment and the model is achieved. Further, the next step consists of changing generating parameters on the water tank and also the coefficients of the Ginzburg-Landau equation, Lechuga (2013) in order to reach a sufficient good approach.