

## Summary

In scientific research practice student 5 courses, group OF-81mn  
National Technical University “Igor Sikorsky Kyiv Polytechnic Institute”

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*On the theme: “Numerical simulation of the nonlinear Schrödinger equation”*

*Scientific supervisor: D. Ph-M. S., Professor V.M. Gorshkov*

*Relevance:* The urgency of such tasks is associated with the rapid progress of laser technology, which now allows to create ultrashort pulses of coherent radiation, whose field in intensity comparable to the fields inside the atoms.

*Problem review:* In the approximate description of large quantum-mechanical systems, equations are nonlinear in the wave function. Build a program for the numerical solution of the nonlinear Schrödinger equation

*Solutions to the problem:* Unlike stationary problems and molecular dynamics problems, for the numerical calculation of non-stationary processes. There are no standard software packages, and the programs are usually or created for a specific task, or they have to be significantly modified when applied to a new problem. For this you need knowledge of basic numerical methods for solving evolutionary equations.

*Result and conclusions:* We managed to paint the algorithm using an implicit difference scheme of the Crank-Nicholson sweep method. the solution of the nonlinear Schrödinger equation was found using the developed program.