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XVII МІЖНАРОДНА ФРЕЇКІВСЬКА КОНФЕРЕНЦІЯ З ФІЗИКИ І ТЕХНОЛОГІЇ ТОНКИХ ПЛІВОК ТА НАНОСИСТЕМ

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Using Maple Environment in Teaching Quantum Mechanics

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In contrast to the classical branches of theoretical physics, such as classical mechanics or electrodynamics, which are quite visual, quantum physics is largely abstract, and it is often difficult to imagine a physical picture of quantum phenomena. At the same time, in recent decades a number of software packages of so-called "computer mathematics" have been developed, which can greatly facilitate the carrying out complex, long and routine calculations, visualize obtained results, and in many cases, implement problem solving.

One of such mathematical packages is Maple computer algebra system, which was developed several decades ago and is continuously being improved. Due to its simple and convenient interface and powerful software, it is widely used not only for educational purposes, but also as a research tool. Therefore, when teaching future specialists, it is important to make this tool familiar to them in their future professional activity.

In this paper, we have considered a number of problems of quantum mechanics, in which the package is used for illustration of the main points of quantum mechanics course, solving exactly solvable problems by means of symbolic mathematical transformations, for which the result can be obtained in analytical form, numerical implementation of finding the solution of problems and graphical presentation of results. A sufficient amount of information on the basic features of Maple computer math package has been presented, which allows the student to actively use the mentioned package and to deepen the skills of its use through self-education.

1. Vozniak O.M., Prokopiv V.V., Nykyruy L.I. Using Maple environment to solve quantum mechanics problems: навчальний посібник. Ivano-Frankivsk: Vasyl Stefanyk Precarpathian National University, 2018. 156 p.