REVIEW

on the final qualifying work of Maria Pavelina on the topic: "**Quantum effects in a polarizing interferometer**", submitted for defense in the master's program "Physics”

Optical vortices are the subject of intensive research in modern optics. There are a vast number of different methods for generating vortex beams, but with the emergence of new tasks, there is a need for the development of new methods. In the final qualifying work, Maria Pavelina investigates a method of generating vortex beams using a polarizing interferometer, one of its possible applications is the generation of optical vortices for transmitting information through the atmospheric channel.

The work is presented in 40 pages and includes 26 figures. It consists of an introduction, three chapters, a conclusion, and a bibliography, including 25 references.

The first two chapters ("Optical Vortices", "Polarizing Interferometer") are dedicated to literature analysis and theoretical description of optical vortices and polarizing interferometer. The first chapter provides a detailed description of the basics of optical vortices theory, presents several possible techniques for their generation and demonstrates methods for registering optical vortices and determining their topological charges. The second chapter presents a comprehensive description of the polarizing interferometer, shows and analyzes the results of light passage with various states of polarization through the interferometer.

The last chapter describes the experiment carried out by Maria Pavelina, which consists of two parts. In the first part, the operation of the polarization interferometer was investigated with linear polarization of the light falling on it. The main result of the first part was the demonstration of the correspondence of the polarizing interferometer operation to the theoretical description given in the second chapter. In the second part, circularly polarized light was incident on the interferometer, resulting in an optical vortex being registered at the output of the

system. In addition, the last chapter proposes a concept of an experiment with a polarizing interferometer for quantum light.

During the final qualifying work, Maria Pavelina made an exceptionally positive impression with her approach to investigating the posed questions. The structure of the work is self-consistent and sequential. There are no significant remarks about the work.

Despite a small number of errors in formatting and grammar, the overall impression of this work is positive. Undoubtedly, this final qualifying work deserves an "excellent" rating.

May 31, 2023  Sevryugin A.A., Ph.D. (Physics and mathematics)