

## REVIEW

of the scientific supervisor on the final qualifying work of Vasily Stolyarov on the topic: "**Metasurfaces sensitive to the orientation of the polarization plane of incident radiation**", submitted for defense in the master's program "Physics"

The master's thesis of Vasily Stolyarov is dedicated to the study and creation of a rotary encoder based on a metasurface sensitive to the orientation of the polarization plane of incident radiation. Tasks related to the fabrication of the metasurface, measuring the parameters of the obtained structure and modeling its spectral properties were accomplished during the work. A key part of the study was an experiment to determine the dependence of the metasurface transmission coefficient at the resonant wavelength on the rotation angle of the polarization plane of incident radiation. The relevance of this work is primarily associated with the fact that using the described metasurfaces as a scale for rotary encoders allows a significant reduction in their size.

The master's thesis provides a detailed description of theoretical aspects enabling the use of metasurfaces as a rotary encoder scale, based on an analysis of many Russian and foreign sources.

During the fabrication and analysis of the metastructure using equipment of the resource centers of the St. Petersburg State University Science Park, the student acquired skills in working with modern experimental installations and analyzing the obtained data using modern software.

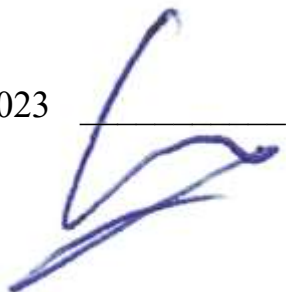
Conducting an experiment to determine the dependence of the metasurface transmission coefficient on the rotation angle of the polarization plane of incident radiation, the master's student demonstrated himself as a proficient experimenter, with skills such as precision, meticulousness, the ability to rapidly interpret received data and confident handling of experimental equipment.

The research results are unique and confirm the possibility of significantly reducing the scale of rotary encoders when using metasurfaces sensitive to the orientation of the polarization plane of incident radiation.

The material of the final qualifying work is presented sequentially, the written speech is competent. Moreover, it should be noted that during his studies in the master's program of the Physics Department of St. Petersburg State University, Vasily Stolyarov's average examination score was 5.0.

The final qualifying work of Vasily Stolyarov meets the requirements for master's theses and deserves an "excellent" rating, and its author is deserving of the qualification of a master in the field of study 03.04.02 "Physics".

May 31, 2023

A handwritten signature in blue ink, consisting of several fluid, overlapping strokes that form a stylized, somewhat abstract shape.

V.Yu., Venediktov, D.Sc. (Physics and mathematics)