To:Dissertation council of MLIT JINR

Re: Vasilisa Lenivenko - recommendation for Ph D approval

Dear Committee members,

I am writing to strongly recommend Vasilisa Lenivenko for the award of a Doctor of Philosophy degree based on her contributions to the SRC project. As a full professor of physics and experimental nuclear physicist at Tel Aviv University, I have had the pleasure of working with Vasilisa for the past six years on this important project.

The atomic nucleus is packed with protons and neutrons. Occasionally, when they get close enough, a proton and a neutron pair up and streak through the nucleus with unusually high energy. These "short-range correlations" (SRCs) account for approximately 70% of the kinetic energy carried by nucleons in nuclei and have extensive implications to nuclear properties. Vasilisa research focuses on experiments conducted to study SRCs using high energy ion beams at JINR in Dubna.

The SRC project at JINR is a challenging and significant undertaking in the field of experimental nuclear physics. It requires extracting very small signals from a large background and poses both objective and subjective challenges. Vasilisa has been an integral part of the international SRC group, contributing significantly to the project's success.

Vasilisa is a hardworking and clever student who has already demonstrated her exceptional capabilities in contributing to performing the experiment and analyzing the yield data to address the project's physics questions. She took an active role in the running of the experiments in 2018 and 2022, participating in shifts and monitoring the systems during data taking. As the senior graduate student in the project, she was responsible for analyzing the incident beam tracking and actively participated in the regular analysis and preparation meetings.

Vasilisa's most significant contribution to the SRC project was her work on the reconstruction of the coordinate detector systems of multi-wire proportional chambers and silicon detectors. With the guidance of her JINR supervisor, Vladimir Vladimirovich Palchik, she developed,

tested, and implemented in the BmnRoot the reconstruction methods for these two detector systems. Her results were essential to reconstruct the kinematics of the SRC and Quasi-elastic reactions of interest and were critical for the first publication of the 2018 data (Nature Physics: "Unperturbed inverse kinematics nucleon knockout measurements with a carbon beam", by M. Patsyuk, J. Kahlbow, et al. Nature Physics 2021 https://doi.org/10.1038/s41567-021-01193-4). Her work on the 2018 measurement is now in use for the analysis of the 2022 data as well.

Based on my experience with many PhD students that graduated under my supervision, I am confident that Vasilisa's experimental contribution to the SRC project meets the requirements for awarding the degree of Doctor of Philosophy. Her dedication, innovation, and hard work make her well-suited for a PhD degree. I wholeheartedly endorse Vasilisa Lenivenko for a Doctor of Philosophy degree.

Thank you for considering my recommendation.

Sincerely yours,

Prof. Eli Piasetzky

The Wolfson Chair in Experimental Physics

School of Physics and Astronomy

Tel Aviv University