Contribution ID: **52** Type: **Oral talk (15 min + 5 min questions)**

SYLA – RUSSIAN 4TH GENERATION SYNCHROTRON

Wednesday, 13 July 2022 15:20 (20 minutes)

For more than 40 years synchrotron-based x-ray sources as well as free-electron lasers based on linear accelerators have been widely used in materials science, spectroscopy, crystallography, research of fast processes, medicine, molecular biology and biochemistry, medicine, and other applied and scientific tasks. Nowadays state-of-art technologies make it possible to design and develop specialized synchrotron that is especially aimed to generate SR by means of insertion devises, such as ondulators or wigglers. Such specialized circular electron accelerators have been called SR sources of the 4th generation. Currently, there are already several operating [1-3] and a number of such specialized SR sources are under design [4-6]. A number of 3rd generation light sources are under modernization up to 4th generation nowdaus. In order to advance the development of the research infrastructure of the Russian Federation, by Decree of the President of the Russian Federation No. 356 of 25.06.2019, a storage synchrotron (the 4th generation SR source) with an energy of 6 GeV and an equilibrium value of the horizontal emittance of the electron beam of no more than 70 pm·rad (SYLA, former USSR4) is being developed on the basis of NRC KI [7,8]. This paper presents the results of the development of the machine lattice as well as top-up linac injector.

1. MAX IV Facility Detailed Design Report / https://www.maxiv.lu.se/
2. EBS Storage Ring Technical Report / https://www.esrf.eu/
3. L. Liu, R. T. Neuenschwander and A. R. D. Rodrigues, Synchrotron radiation sources in Brazil / .Phil. Trans. R. Soc. A 377: 20180235 (2019).
4. I. Agapov et al. PETRA IV: the ultralow-emittance source project at DESY / J. Synchrotron Rad. (2018). 25, 1277–1290.
5. M. Borland et al., Hybrid seven-bend-achromat lattice for the Advanced Photon Source Upgrade / Proceedings of 2015 IPAC, pp. 1776–1779.
6. HEPS Xu G., Cui X.H., Duan Z., Guo. Y.Y. / Proceedings of International particle accelerator conference. – Denmark, 2017 – P. 2697 – 2699.
7. S. Liuzzo et al., USSR HMBA Storage Ring Lattice Options // 12th IPAC, May 2021, Online, Brazil. TUPAB049.
8. L. Hoummi et al., Optimization and Error Studies for the USSR HMBA Lattice // 12th IPAC, May 2021, Online, Brazil. MOPAB224.

The speaker is a student or young scientist

No

Section

1. Synchrotron and neutron radiation sources and their use in scientific and applied fields

Primary author: DYUBKOV, Vyacheslav (NRNU MEPhI, NRC KI)

Co-authors: Mr TSYPLAKOV, Eugenio (NRC KI); Prof. POLOZOV, Sergey (NRNU MEPhI, NRC KI)

Presenter: DYUBKOV, Vyacheslav (NRNU MEPhI, NRC KI)

Session Classification: Synchrotron and neutron radiation sources and their use in scientific and applied fields