

REVIEW OF THE THEME

« Improvement of the DLNP (JINR) Phasotron and design of cyclotrons for fundamental and applied research »

The Phasotron is the oldest accelerator at JINR, which is to this day an operational unit of the Dzhelepov Laboratory of Nuclear Problems. The main research areas are medical and biological research on hadron beams, as well as conducting physical experiments PHASA, BURAN.

In recent years, the Phasotron has been working stably for an average of 1000 hours per year. About 80% of these are spent on medical research. To maintain proton therapy research, it is necessary to ensure the uninterrupted operation of the Phasotron for medical beams and further improvement of its equipment.

For these purposes, during the period from 2012 to 2018, modernization of the automatic control system for the transport line (ACS-T) was conducted as well as improvement of regulation and stabilizing system by replacement of electronic equipment and development of new software. Replacement of the beam tracts' power supply system is the most important stage of modernization and ensuring stable operation of the Phasotron.

Another high priority of the theme is development and improvement of cyclotrons for medical and applied research. This applies in particular to the development of medical accelerators for proton and carbon therapy. In 2016 - 2018 cyclotrons for proton therapy and other medical applications SC202 (China, JINR), AIC-144 (INP, Krakow, Poland), K230MeV (Ionetix Corporation, USA) were under development or modernization by the Department of New Accelerators of the DLNP JINR.

The research program proposed within the theme «Improvement of the DLNP (JINR) Phasotron and design of cyclotrons for fundamental and applied research» for 2019÷2021 is a continuation of research conducted in 2016÷2018.

Based on the above, I recommend an extension of the theme «Improvement of the DLNP (JINR) Phasotron and design of cyclotrons for fundamental and applied research» for 3 years as a first priority.

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