

**Review Report on Proposal**  
**“Development of a physics program and detectors for experiments at CEPC”**  
**at the Dzhelapov Laboratory of Nuclear Problems, JINR**

Since the Brout-Englert-Higgs boson discovery searches for new physics beyond the standard model (SM) of elementary particles became a primary goal of modern fundamental physics. This is because the SM, being an effective low-energy approximation of a fundamental theory does not include gravity, still cannot explain CP-violation, neutrino oscillation, mass creation mechanism, Universe Dark mass, etc.

There are projects for future direct searches for new particles beyond the standard model and indirect precision measurements for its manifestations. One of the leading projects is a circular electron-positron collider (CEPC) in China, which can be approved as soon as the next year. CEPC with a circumference of 100 km will be a Z-boson/Higgs-boson/ $t\bar{t}$  – factory with unprecedented high luminosity. Later it could be converted to 100 TeV proton-proton collider.

The main goal of this two-year Project is to prepare physics proposals for the CEPC research program, to participate in software and computing development, and to perform a series of detector R&D useful for CEPC. The proposed Project is a continuation, development and extension of the current project for 2025 concerned specific tasks and objectives towards CEPC.

The Project workplan contains detailed description of tasks for:

- i) development and proposals for CEPC experimental physics program;
- ii) theoretical high-precision calculations needed for physics support of CEPC experiments;
- iii) software and computing development;
- iv) detector R&D.

A strong side of the well-prepared Proposal is that the participants of the present Project from DLNP, LHEP, BLTP and MLIT of JINR have a strong record of successful participation in the major collider experiments: ATLAS and CMS (LHC), CDF (TEVATRON), DEPLHI (LEP), H1 (HERA) and BESIII (BEPC).

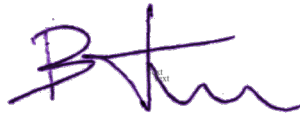
The proposed manpower, working schedule, methods and techniques, computing resources and cost estimates seem to be relevant and reasonable.

During the two-year Project period the participants of the Project will obtain significant novel results, which should be very useful for CEPC development program.

Therefore, the Project would prepare the grounds for possible full-fledged participation of JINR in the experiments at CEPC, in case of its approval by the Chinese government.

To conclude, I recommend approving the proposed Project.

April 16, 2025

A handwritten signature in purple ink, appearing to read 'V. Kim', with a stylized flourish at the end.

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