The Referee report on the completion of theme
"Theory of Fundamental Interactions" (01-3-1113-2014/2018)
and opening of new theme :

"Fundamental Fields and Particles Interactions".

The results obtained in the course of the completion of theme 01-3-1113-2014/2018 are well known to the experts and are widely presented in publications in high-rank journals and talks at prestigious international conferences.

One may specifically address the studies of supersymmetric extensions of the Stndard Model, quantum field theories with extra space-time dimensions, calculations of the radiative corrections to Standard Model, in particular, the corrections to the Higgs potential, which are of importance for the problem of vacuum stability, detailed investigations of particle motion in arbitrary electromagnetic and gravitational fields, calculations of QCD higher twist and spin effects in hard inclusive and exclusive processes, studies of the exotic and heavy quark states, investigations of dense hadronic matter, including chiral and spin effects.

The directions in the new theme follow five projects, which are rearranged according to the modern trends, with the special attention to the support of NICA experiments:

1. "Quantum field theory and physics processes beyond the Standard Model",
   The Project leaders D.I. Kazakov, A.V. Gladyshev, and A.V. Bednyakov;
2. "Theory of Electroweak Interactions and neutrino experiments",
   The Project leaders A.B. Arbuzov, V.A. Naumov, and F. Shimkovits ;
3. "QCD and spin-3D structure of nucleons",
   The Project leaders I.V. Anikin, and O.V. Teryaev;
4. "Strong interactions phenomenology and precision experiments",
   The Project leaders M.A. Ivanov, V.I. Korobov, and A.E. Dorokhov;
5. "Theory of hadronic interactions under extreme conditions",
   The Project leaders D. Blashke, V. Braguta, E. Kolomeitsev, and S.N. Nedelko.

The financial support is increased in accordance with the JINR budget growth. The substantial growth amounting to 150 k$ per year is requested for the international cooperation. The growth may be justified by the increasing international collaboration, which is of particular importance for the activity supporting the NICA physical program.

In my opinion the new theme “Fundamental Fields and Particles Interactions“ is very intersting from various physics prospects, especially, for physics studies at the LHC and at future collider NICA. The JINR teams in each of the proposed five projects have the necessary experience and a significant scientific background. The financial request is duly justified.

Therefore, I strongly recommend the approval of the new theme “Fundamental Fields and Particles Interactions“.

E.Boos
Professor
Member of PAC