**The Referee report on the new theme:**

**“Fundamental Fields and Particles Interactions“.**

The new theme is going to be a natural continuation of the existing one “Theory of Fundamental Interactions” (theme number 1113), results of which obtained during the previous time period are well known from numerous publications and talks presented by its authors at the International conferences.

The new theme includes five Projects:

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.

Each of the Projects includes development of specific problems of the strong or electroweak interactions of particles and theoretical support of the corresponding experiments carrying out or planning by the JINR participants at the home and outside facilities. Subjects of the Projects coincide with the present world status and trends in the theory and experiments.

Taking into account that the Standard Model (SM) predictions are confirmed by numerous experiments, it is considered now as a candidate to the unified theory of the Strong and Electroweak interactions. Further precision experiments confirming or disagreeing with the SM predictions are equally important in this respect. Due to that, the theoretical supports of the current and planning experiments in these fields are very welcomed.

I would like to give one example of the new experimental project requiring the theoretical support at the stage of the Proposal preparation. This concerns the project suggested at the JINR in a form of the Letter of Intent on “Spin Physics Experiments at the NICA – SPD with polarised proton and deuteron beams”. Potentially, within this project one can measure (for the first time) all parton distribution functions in the proton predicted by the QCD in the first approximation and finally to resolve the long standing “proton spin crisis”. The support is required in construction of the model for simulations.

I recommend approving the theme for the next five years with the first priority.

Professor I.A. Savin