

Referee report

on the project

“Development of the particle detection methods for future experiments with the JINR participation”

The project deals with instrumentation, the purpose of the project is to satisfy demands of future experiments: to obtain the improved detector characteristics and to optimize their designing. The authors of the project are already conducting instrumentation studies in the frame of several JINR projects. The current reviewed project structurally joins these works, and also adds new directions in development of particle physics detectors.

The project authors have a good experience in development, creation and running of the hadron and electromagnetic calorimeters of ATLAS at LHC: they have measured the energy resolution and response linearity, studied transversal and longitudinal profiles of hadron showers, found non-compensation of the hadron and central electromagnetic calorimeters, and other parameters.

Apart from the calorimeter studies, the project authors worked also in other different fields of experimental instrumentation: investigation of properties of the scintillating crystals, gas detectors like straw-detector and Micromegas, radiation resistance of scintillating materials and electronic components. Miscellaneous experience of the participants, both in detector development and in computer simulations, gives the confidence in reaching the declared project aims.

Among the project tasks on electromagnetic calorimetry, it is planned to investigate a longitudinal granulation of calorimeters. This can be useful for improvement of time and energy resolution in future experiments at colliders, in particular, at CEPC.

There will be studied a radiation resistance of scintillating crystals and some semiconductor materials what is important not only for experimental physics but also for atomic and cosmic industry.

The authors envisage development of gas detectors with resistive elements what can improve stability of their functioning. New scintillating materials for detection of thermal neutrons will provide a high detector efficiency simultaneously with low sensitivity to gammas.

As the results of the project, the fulfilled developments can be implemented while creating the new experimental setups with the JINR participation in particle physics.

The request for financial resources is adequate to the project tasks.

I would like to make two small remarks to the project.

1. One could want to know, how many young scientists are within the cited 19 FTE.
2. Among the strong sides of the project there is mentioned availability of beams of electrons (LINAC-200) and neutrons (IBR-2M). Just now it can hardly be named the strong side, because unfortunately both these facilities are not certified yet, and the beams are not available to the users. Hopefully, they will be available in future.

To my opinion, the project has to be approved due to doubtless expediency of the formulated aims in development of the experimental instruments and methods.

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