Referee report on the project

Physics research at ATLAS experiment at the LHC (JINR participation)

The ATLAS experiment at the LHC at CERN is one of the world leading experiments in the field of high energy physics. Since the first proton-proton collisions delivered by LHC in 2010 and during subsequent 15 years of data taking, ATLAS detector demonstrated excellent performance that led to many publications of high class physics results.

JINR successfully participated in the ATLAS collaboration since its very foundation and made significant contributions to construction of the experimental facilities and maintaining of the detector. During this period, JINR physicists have also played leading roles in several ATLAS software projects and simulation studies, provided theoretical support, suggested and conducted many physical analyses. This work continues. New experimental data, that has been and is being obtained during 'Run3' period of data taking (2022-2026) is expected to provide new exciting results in the fields of Higgs boson and heavy quark physics, high-precision tests for the Standard Model predictions, expand limits in the searches for the phenomena beyond SM, etc. Several new interesting experimental studies are already suggested by the JINR team. As it is justified in the project extending plan, JINR physicists are going to continue taking an active part in all fields of physical analysis.

In the vicinity of the LHC Long Shutdown 4 planned for 2026-2029, the importance of participation in software development within preparation for high-luminosity runs come to the fore. The JINR team increased its contribution to software support of the experiment during last years and gained valuable experience in some of the software projects, e.g., databases development, event indexing, detector simulation studies, trigger software and others. It should be stressed that this experience is also very important for other projects at JINR, like NICA, Baikal-GVD, etc.

In general, I would like to fully support the application of the JINR ATLAS group for continuation of its participation in the ATLAS experiment for the period of 2025-2029. It is of a great importance for JINR to continue being involved in that big international project. Theoretical and experimental research programs performed within the ATLAS collaboration motivates our physicists and provides inestimable experience for them.

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