

Referee report on the project

Physics research with ATLAS detector at the LHC Run-III (JINR participation)

The ATLAS experiment at the LHC at CERN is one of the world's leading experiments in high energy physics. It is extremely successful being running for 10 years and is now aimed to the third phase of Run III. JINR participated in ATLAS from the very beginning at the stage of construction, the first years of running, maintaining of the detector, developing the software and physical analysis. This was and is the fruitful collaboration between CERN and JINR. The Run III is expected to be the last one before the big shutdown and will definitely bring a lot of new largely anticipated data. Participation in this activity is by far the first priority task.

Thus, the subject of review is not the experimental project itself but JINR participation in it. As it was already mentioned, JINR has a long history of participation in ATLAS and it was quite successful. During the period of 2015 – 2019 there were published over 20 papers with significant participation of the JINR staff, more than 20 talks at different conferences and meeting excluding collaboration meetings were given. JINR group participated in the running of the Hadronic Tile Calorimeter, in the Liquid Argon hadronic calorimeter, in physical analysis within the ATLAS Standard Model Working group, in the ATLAS Higgs Working group, in the ATLAS Exotics Working group, in the ATLAS SUSY Working group, etc. JINR also participated in the ATLAS software development. One should specially mention the SANC group which is one of the leading in analytical and numerical calculations for experiments at colliders in the world.

It should be stressed that during the 2015 – 2019 period the JINR group shifted its activity towards the physical analysis that becomes even more important now. The visibility of JINR at ATLAS when construction period is over is directly related to physics results, active participation in the working groups, the software development, talks at the conferences on behalf of the collaboration. This part should be further strengthened and taken care of. The other important issue is the involvement of new young members in the JINR group. My impression is that JINR ATLAS group should pay more attention to this problem, recruiting students and PhD students, arranging their education and involvement in research at early stages.

In total I fully support the application of the JINR ATLAS group for continuation of participation in ATLAS experiment for the period of 2020-2024. It is of a great importance for JINR. We should use the facilities of CERN, to which JINR contributed so much, in full strength, we should not weaken our positions there. There is a broad strongly integrated program of theoretical and experimental research using a wide variety of modern tools and techniques and we have to participate in it.

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