Referee report on the project Upgrade of the ATLAS Detector

Theme 02-0-1081 – 2009/2019

by Hans Gutbrod, 26/01/2020

The JINR ATLAS group has submitted a proposal to participate in the **Upgrade of the ATLAS Detector for the next 3 years ( 2021-2023)**

There is no doubt that during past years the JINR ATLAS group made significant contribution to ATLAS detector. It now intends to contribute to the upgrade of the ATLAS detector subsystems – **Muon Spectrometer** and **Calorimeters**.

Presently the situation is as follows:

Existing commitments in the ATLAS Phase-I Upgrade are to be fulfilled by the end of 2020. Majority of the upgrade works are designed to satisfy Phase-II requirements, and will continue operating in ATLAS throughout the Phase-II period. The Phase-I Upgrade is targeted primarily for installation during the 2nd long shutdown (LS2) in 2019-2020, and Phase-II (HL-LHC era) during LS3 in 2024-26.

In **May 2019** the JINR Director has signed the MoU’s for the Dubna participation in Phase-II upgrade programme. So, there is nothing to be refereed, since the work is going on and JINR has made commitments to the collaboration ATLAS.

If asked, I am strongly in favour of the continuation of DUBNA’s participation in ATLAS. I concur with the two fellow referees in recommending to approve continuation of the JINR group participation in the ATLAS Upgrade project for the next 3 years (2021-2023).

**However, I would like to make some comments:**

There was a time when CERN collaborations appreciated strongly the “cheap but well-trained labour” from Dubna and they were happy to get many instruments and detector parts built in and around Dubna. These days should be over today.

This proposal separates the ATLAS team into those who build hardware and those who do physics analyses as written in the proposal: “It is worth noting that within the JINR ATLAS team the upgrade related part has no manpower overlap with those involved in the physics analyses.” Furthermore, the authors write: “*A total number of personnel in the JINR group participating in the ATLAS Upgrade program are 53 providing 35 FTE. They are 31 physicists, 17 engineers and 5 technicians*.” That means these are those who do work in both hardware R&D as well as in fabrication and assembly.

Here comes my criticism:

The authors write*:” Within the upgrade project for Muon Spectrometer we will continue* ***intensive mass-production*** *of the MicroMegas chambers and quadruplets assembly for the NSW projects*. *JINR became the third research centre in the world, after CERN and CEA Saclay, that possesses the full technological chain of equipment and is capable to produce bulk Micromegas detectors”*. This term *intensive mass production* is telling me that JINR is doing a factory-job, most other institutes cannot do. I know that JINR has excellent technicians and I know that collaborations need institutes like JINR DUBNA.

However, does JINR gets its recognition as a scientific laboratory or as an industrial complex?

The DUBNA membership at ATLAS is listed at CERN as:

**Dubna**

140 ATLAS active members
36 ATLAS authors
15 PhD students

Project contributions:

* Detector systems: Muon spectrometer, Tile calorimeter, LAr calorimeter, Trigger/DAQ
* Phase-I upgrade: New Small Wheel, LAr calorimeter, Tile calorimeter
* Phase-II upgrade: Trigger/DAQ, HGTD, LAr calorimeter, Muon spectrometer, Tile calorimeter

This is a ratio of 3.88 in Active Members/Authors. As was mentioned in earlier PACs, one cannot see any benefit for JINR in supporting that high number of *active members* but not qualified for authorship. What are these *active members* doing? Compared with other institutions listed below, I find that DUBNA’s ratio of 3.88 in Active Members/Authors is nearly twice higher as the average of other institutions.

Typically, the ATLAS member Institutions have about a ratio of 2:1 in Active Members/Authors. Here are two examples:

**IHEP**

34 ATLAS active members
17 ATLAS authors
3 PhD students

Project contributions:

* Detector systems: ID Gen, Tile calorimeter, LAr calorimeter, Muon spectrometer, ID SCT
* Phase-I upgrade: BIS78, New Small Wheel
* Phase-II upgrade: Tile calorimeter, LAr calorimeter, Tile calorimeter, Muon spectrometer

**MPI Munich**

61 ATLAS active members
28 ATLAS authors
7 PhD students

Project contributions:

* Detector systems: ID Pixel, LAr calorimeter, ID Gen, Muon spectrometer
* Phase-I upgrade: BIS78
* Phase-II upgrade: ITk Pixel, ITk, LAr calorimeter, Trigger/DAQ, Muon spectrometer

**Therefore, my conclusion is:**

I am strongly in favour of the continuation of DUBNA’s participation in ATLAS. I support the group’s intent to rejuvenate the team.

I concur with the two fellow referees in recommending to approve continuation of the JINR group participation in the ATLAS Upgrade project for the next 3 years (2021-2023).

However, the ATLAS Team needs to presents itself in a much more transparent way. There are several possible interpretations of the present published manpower-situation:

1. The number of Active Members is too large for the JINR contribution in the ATLAS Upgrade program or
2. The large number contains members of the technical infrastructure needed for the ***intensive mass-production.***
3. The number of authors is too small, i.e. the scientific recognition is not large enough.
4. There are simply to many passengers on board of the JINR-ATLAS team.

I am looking forward to a modern and rejuvenated ATLAS team, focussing more on R&D and on Science and on getting more invited talks on the fascinating physics harvested by ATLAS, accompanied by a modern technical team of JINR which is properly recognized and accounted for.

Heidelberg, 25. January 2020

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