

Referee report on the Project HADRON PHYSICS WITH THE COMPASS EXPERIMENT (JINR participation)

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The report given to the Program Advisory Committee of JINR on 16th January 2017 outlines the activities proposed by the JINR researchers in the framework of the CERN COMPASS experiment and deals with the plans in view of the future detector operation and data analysis concerning hadron physics. It describes the work to be carried out in the years 2017-2019.

The COMPASS experiment and its past achievements have been already discussed for the case of the COMPASS-II project. This specific proposal deals with a series of science goals concerning hadron physics:

- precise measurement of the differential cross section $d^3\sigma/dp^3$ of prompt photon production for pion and proton beams. These data can be used for a better knowledge of the gluon structure function of pions and nucleons;
- observation of prompt photon production with kaon beams. This could be an important measurement of the gluon contribution to the kaon structure functions.
- possible observation of the gluon EMC effect.

The group also intends to work on the R&D for the upgrade of the Muon Wall detector and eventually on its realization, starting in 2019. One could argue if the total sum of 60 k\$ could be sufficient for a meaningful R&D activity. One option could be using resources from the COMPASS-II proposal, e.g. from the Material and Equipment items.

All the above activities are worth to be supported, since they are data analysis driven and could open the way to a series of interesting science developments. Moreover, one could expect a relatively large visibility of the group, beyond the mere participation in the data taking and detector maintenance work.

Under these circumstances, the referee considers that the project must be continued for the period 2017-2019 and supported with first priority, only if the COMPASS JINR activities will be centralized into a single, common proposal.



Prof. Dr. Antonio Ereditato

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