

Report on the project COMPASS-II STUDIES
OF THE NUCLEON AND HADRON STRUCTURE AT CERN
(theme 02-0-1085-2009/2019, prolongation for 2017-2019)

Experiment COMPASS is oriented to the study of nucleon structure and hadron spectroscopy with the beams of the CERN SPS. The experiment has a longer and rich history (starting 2001, COMPASS-II since 2010). The significant advantage and strength of the COMPASS comes from the fact that polarized configurations of both, muon beam and nuclear target, are enabled. The nucleon spin structure is a topic, to which COMPASS has contributed significantly (e.g. quark spin contribution $\Delta\Sigma$ and gluon helicity $\Delta g/g$). Further, the nucleon spin structure is interconnected with the questions of intrinsic quark motion e.g. in terms of TMDs, GPDs, which represent the important steps to deeper understanding of nucleon structure in the language of QCD. The list of obtained results is rather impressive, COMPASS Collaboration has published 53 papers in total, involving the very important and highly cited results. That is why the COMPASS got privilege to continue its program at CERN, where at present the LHC physics is dominating.

The program of present project involves: Continuation of analysis of the muon and hadron data taken up to 2016, preparations of equipment, additional data taking in 2017-2018 and analysis in 2017-2019. In parallel with the GPD program, high statistic data for TMD PDFs in SIDIS will be collected. Important tool for GPD studies will be the new electromagnetic calorimeter ECAL0 providing registration of events in significantly wider kinematic region in addition to the existing calorimeters ECAL1 and ECAL2. ECAL0 was developed at JINR in collaboration with groups of physicists from Munich, Freiburg, Warsaw, Saclay, Prague, CERN and colleagues from Kharkov. I believe the present program planned till 2019 will again bring excellent results. Finally, let me mention the JINR COMPASS team is also effectively profiting from an active cooperation with the renowned theorists from BLTP.

The contribution of highly qualified JINR team to the COMPASS-II results is greatly respected. At present the groups from laboratories VBLHEP and DLNP have merged, which will allow even more effectively to participate in the larger collaboration of COMPASS. One should here mention that suggestions presented in the 46th regular meeting of Programme Advisory Committee for Particle Physics have been fully reflected in a revised project proposal. Now the team has the clear structure, transparent financing and responsibilities, well defined strategy and objectives.

To conclude, in view of the above arguments, I recommend the submitted project COMPASS-II studies... for approval with the first priority.

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