

Review of the project “NA64 experiment at SPS CERN”

The description of the project is quite short, but contains the essential information to evaluate its quality. The NA64 experiment is designed to probe the Dark Sector physics in missing energy events. It has broad research program with e^- , μ , π , K , and p beams at SPC. The search for invisible decays of dark photons, invisible decays of (pseudo)scalar mesons and interactions producing invisible final states is based on innovative approach, where the active beam dump is combined with missing energy technique. During the first stage of the experiment in 2016-2017 the experiment collected 14.7×10^{10} events using 100 GeV electron beam. The results of the first stage have been published in 4 articles in journals with high impact. In addition, 9 publications have been prepared to describe the technical aspects of the experiment.

The JINR group is responsible for the design, production, tests and installation of 14 straw tube chambers, together with their data acquisition software, raw data decoding, online monitoring and visualization, reconstruction and Monte-Carlo simulation. The members of the group participated in the data taking runs and took care of the operation of the straw tube detector.

The group consist of 8 researchers, who are co-authors of the papers, and 5 members of the NA64 technical support. At the same time the total FTE of the researchers is only 2.4, while the total FTE of the technical staff is 2.3. In my opinion the number of FTE should be higher for an efficient collaboration. In addition, the members of the JINR group did no present any result at conferences or seminars, which is clearly a weakness of the project. Another suggestion would be to involve young researchers and PhD students in the work of the experiment.

The plans of the JINR group are to participate in the reinstallation of the equipment at H4 channel of the SPS, to develop new large area straw tube chambers for the muon run in 2021, to work on the data analysis, data reconstruction and MC simulation. Some R&D with cosmic and ion-sources aimed at the improvement of the chamber characteristics, tests of electronics and DAQ modernization are foreseen together with the preparation of stage 2 proposal.

The requested budget for 2019: 20 k\$ - materials and equipment; 10 k\$ - common funds; 30 k\$ - travel, is adequate to the planned activities.

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