# Review of the proposal
# „Search for new physics in the charged lepton sector"
# (Mu2e & MEG-II)

High precision experiments with muons offer very interesting opportunities to search for new physics beyond the Standard Model. Examples are searches for neutrino-less muon to electron conversions which have extremely low rates in the Standard Model. Such processes are sensitive to New Physics in a complementary way as compared to collider experiments reaching out to much higher energy scales. Examples are processes which violate flavour conservation in the charged lepton sector (cLFV). This proposal is about continuing the JINR participation in the Mu2e experiment at Fermilab (USA) searching for $\mu^- N \rightarrow e^- N$ and to join the MEG-II project at PSI (Switzerland) which will look for $\mu^+ \rightarrow e^+ \gamma$. Both experiments have a sensitivity largely exceeding the current experimental limits on these processes and are therefore scientifically very interesting.

The proponents suggest continuing the JINR engagement in the Mu2e experiment by contributing to the construction of the Cosmic Ray Veto detector and possibly the calorimeter. I fully support the plan to set up a remote control room for the experiment in Dubna which will facilitate the active participation of JINR scientists in the operation of the experiment. The proposal foresees only one FTE for data analysis in 2023 which might be insufficient to play a visible role in the physics harvest of Mu2e which matches the investment JINR made into the detector.

The second experiment is MEG-II with planned contributions to the DAQ system, software development and supplying computing resources. Also contributions to the upgrade and maintenance of the drift chamber are part of the proposal. The plans for physics analysis are clearly presented but again only one 1 FTE is allocated to this task. Also, I note that only one person of the MEG-II JIR group is fully (100%) committed to the project whereas several members only to a small fraction of the time. This may not be the ideal situation to lunch a new initiative.

Mu2e and MEG-II are both world-leading experiments in the field of cLFV. JINR has successfully contributed to experiments with high-intensity muon beams. A clearer view on how JINR will contribute to the analysis and participate in the physics harvest of the experiments would be desirable. It is understood that JINR has invested already in the Mu2e experiment but the future plans should be balanced and synchronized with the planned engagement in COMET which has very similar physics goals. With these recommendations in mind I support this proposal.

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