

Referee report to the joint NP+PP PAC at Dubna, 22. January 2019

Theme 1134 “Experiment COMET at J-PARC”

The COMET experiment will search for neutrino-less $\mu \rightarrow e$ conversion on a nucleus (Al) down to a sensitivity of 10^{-17} which exceeds the present upper limit by four orders of magnitude. It represents one of the most important searches for physics beyond the SM (flavor violation). The main goals and impacts of the experiment are well described.

The JINR contributions to COMET are R&D, construction and tests of two significant components of the detector: the Electromagnetic Calorimeter (ECAL, now with LYSO crystals) and the Straw tube tracker. The components for phase I were successfully delivered and tested, and the development of improved versions for phase II are well underway.

The technical support and contributions by Dubna are clearly very important and decisive for the success of COMET, however not much seems to be in preparation yet for active participation by Dubna scientists in running the full apparatus, data taking and analysis of the experiment. A commitment in this direction will be very important, if Dubna wants to get credit on the future results and obtain a strong scientific visibility during the execution phase. This is also manifested in the numerous technical publications and talks at the collaboration meetings, but in no talks at conferences.

Since KEK is financing the bulk part of the experiment, the financial contributions from Dubna for the detector components seem to be alright. For the participation on runs, probably more resources may be necessary, once the experiment is in production stage.

One remark should be made conc. the international competition: There is worldwide a second $\mu \rightarrow e$ conversion experiment at Fermi Lab (Mu2e) underway which uses almost exactly the same setup and which envisages the same scientific goal. A different Dubna group is supporting it in a similar way, see theme 1124 “Mu2e and g-2”, also discussed at this meeting. Since both efforts deserve support, it could be difficult to define priorities in case of short resources.

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