H2020 Grant Agreement N° 101006726

Minutes of the aMUSE Scientific Board Meeting
30 September 2022 - 1:00 am CSET

Attendees: M. Casarsa (INFN-Trieste), F. Collamati (UniRM), E. Diociaiuti (INFN-LNF), M. Fertl (JGU), S. Giovannella (INFN-LNF), S. Müller (HZDR), A. Papa (*chair*, PSI), F. Renga (UniRM), M. Silarski (JU)

Excused: G. Burzachechi (FS), A. Ferrari (HZDR), M. Gallinaro (LIP), M. Incagli (INFN-Pisa), D. Lucchesi (UniPD), D. Stöckinger (TU), L. Zoia (UniPD)

Agenda:

1. Approval of the minutes of the previous meeting
2. aMUSE first report
3. Status of the different Work Packages and next steps
4. a.o.b.

A. Papa apologize that she can only attend the start of the meeting, due to an unexpected problem with an RF accelerator. At PSI S. Giovannella will chair the meeting on her behalf.

Minutes from last meeting, held in June are not yet ready. They will be circulated by A. Papa and approved by email.

Report from WP1:

- **M. Fertl, g-2** - Run 6 with positive muons is expected to start mid-November.
- **S. Giovannella, Mu2e** - Assembly of calorimeter at Fermilab is in progress. Crystals stacking of the second disk is completed. The assembly of the Read Out Units (ROUs), composed by two SiPMs with their FEE boards, is planned to start in October.

Report from WP2:

- **F. Renga, Muon Surface beams -** aMUSE researchers participated to the Snowmass CLFV working group in July, contributing to the proposal to extend the CLFV program with the Advanced Muon Facility at PIP-II. The proposal foresees the usage the Mu2e-II storage

ring option to search for the $\mu \rightarrow e$ decay process. The project was presented in details, receiving positive feedbacks. S. Giovannella propose to upload the presentations and the CLFV summary paper on the aMUSE web site. F. Renga contacted Bob Bernstein and Bertrand Echenard, chair of the Snowmass "Rare Process and Precision Measurements" Community Study and Snowmass co-convener of the CLFV WG, respectively. Both of them want to be included in the newly started collaboration involving aMUSE scientists and Japan research groups for the design of innovative detectors.

- **S. Mueller, Mu2e-II** - New results on Mu2e-II simulation studies were presented at the SATIF-15 conference on the optimization of the proton target and the simulation of the beam background.

Report from WP3:

- **A. Papa, Muon beams cooling** - Focus is on the extraction on μ beam longitudinal and transverse directions. Activities on MC to define conditions: E, flux of helium, flux on vacuum station. Improvement from June: all simulation running. Distinguish simulation and checking working conditions.
- **M. Casarsa, Muon Collider** - aMUSE researchers participated to the Snowmass final community meeting. Muon Collider was a real success both in visibility and interest. American colleagues interest might be reflected in the P5 report and US could get found for this research field. The summary paper (~100 pages) is going to be published on EPJ-C, merging five white papers submitted to Snowmass. The collision characterization at 10 TeV is in progress, design detectors able to operate at that energy.

Report from WP4:

- **Francesco Collamati, Muon Collider** - The simulation for beam induced background at 1.5 TeV is completed, and the effort is now focusing to 3 TeV. There is a joint collaboration with the CERN group on this, using common tools. First results will be presented in October at the First Muon Collider Collaboration Meeting at CERN.

Report from WP5:

Frascati Scienza is committed to the 2022 European Researcher's Night today. A report on this and other outreach activities will be presented at the next Scientific Board meeting.

Report from WP6:

- **S. Mueller, Irradiation test** - Deadline to submit request at HZDR was anticipated this year. We did not submit any request, but there is the possibility to perform parasitic runs for neutrons.
- **M.Silarski, Detector for hazardous substances** - AmBe source measurement done but not finalized. Results are promising, but not yet ready to be presented. The Krakow group is trying to organize a Deuterium-Deuterium source test for the second part of 2023.
  S. Giovannella informed the SB members that a Mu2e colleague from Ancona is in contact with Saint Gobain Research (SGR), which is in a different location, always near Paris, with respect to Saint Gobain Crystals. She is exploiting the possibility to be hosted by SGR for testing purposes, since at the moment SGC can host us for no more that 1 day for Covid + security reasons.

Report from WP7:

- **S.Giovannella, Management** – The project is in line with the completion of deliverables and milestones. Next steps are the two milestones planned for end of December: ILCSoftware update (WP4) and planning of irradiation tests (WP6). F. Collamati informed the board that the work on ILCSoftware is proceeding as expected, and no delays for the milestone completion are expected. Concerning the irradiation tests, the calibration of the neutron beam in collaboration with LNF colleagues is planned for the beginning of 2023. The next deliverable is the first official report to the European Community, due on 31 January 2023. It is a compact report, about 10 pages, focusing on the progress of the action and possible delays and risks, with plans to control and mitigate them. The most critical aspect are the delays in secondments. They are connected with the pandemic still high in the start-up phase. The situation is improving, but we need to increase the number of travels, especially from the institutions that haven't start yet.

The meeting is adjourned at 1:30 pm CEST. Presentations with reports from Working Groups are available at the event web page http://amuse.lnf.infn.it/event/sb-meeting-september-2022/

The next Scientific Board meeting will be held in December 2022.