**Minutes of the Meeting of the PERLE Collaboration Board (CB) March 8th 2024**

Present: Meeting held via Zoom

BINP: -

CERN: Oliver Brüning

Cornell: Georg Hoffstaetter

ESS Bilbao: Juan Luis Munoz

Cockcroft Institute: Stewart Boogert

Daresbury AsTEC: Deepa Angal-Kalinin

J-Laboratory: Rong-Li Geng & Andrew Hutton

Liverpool U: Max Klein for Carsten Welsch

Al-Najah U: Hadil Abualrob

IJCLab / Orsay: Achille Stocchi

LPSC /IN2p3: Maud Baylac

Invited: Jorgen d’Hondt

Ex officio: Walid Kaabi and Max Klein

The meeting was called by Achille. The meeting was chaired by Oliver Brüning.

The following agenda was agreed:

1. Welcome and approval of the minutes of the last meeting
2. PERLE Technical Status – Walid Kaabi
3. Timeline, site choice at Orsay, obtained and future funds, ongoing discussions with collaborators – Achille Stocchi
4. Activities in Partner Institutes
5. PERLE Collaboration, Membership and Publication Policy – Max Klein
6. Plan for the next Collaboration Meeting
7. AoB

**1. Welcome**

Oliver Brüning welcomes the participants and thanks Walid for the preparation of the meeting.

The minutes of the last meeting were approved and there were no actions triggered at the last CB meeting.

**2. PERLE Technical Status**

Walid Kaabi presents a summary of the PERLE status. Highlights of ongoing studies include the publication of the PERLE paper that will be featured on the Physical Review PRAB homepage alongside other
highlighted articles: <https://journals.aps.org/prab>. Walid thanks Alex Bogacz for coordinating the writing and submission of the paper. Further technical highlights include beam dynamic studies with collective effects, arc length corrections and misalignment errors and a look at expected beam losses and required beam diagnostics. The studies look at two different options for the single turn configuration: with and without B-coms.

Walid Kaabi continues with a status report on the electron source installation at IJCLab. Within a Collaboration Agreement for photoinjector R&D between IJCLab (IN2P3) and Research Instruments GmbH (RI), hardware of the lighthouse project (terminated) was transferred to IJCLab for PERLE. The equipment was received at Orsay in 3 shipments by end of December and end of January. After site studies of the two possible locations to host PERLE (Super ACO hall and Igloo), the IGLOO was considered to be the preferred solution. The previously installed ALICE photogun was removed from the IGLOO bunker and a new platform for the installation of the new source was assembled in the IGLOO. The photocathode laser was received, tested and accepted at the end of 2023. A young engineer was hired in November 2023 for the laser implementation. Specifications of the 5-cell 800MHz cavity are being finalized, with a review planned for March 2024 @on cavity treatment processes to enhance its performance. Within the iSAS program the Nb procurement will be launched before summer 2024. The design of the PERLE buncher cavity is advancing well, work done by Luis Munoz from ESS-Bilbao and discussions are ongoing with HZB and Cornell University to recuperate the Bessy cryoplant and the C-BETA spreader magnets for PERLE.

**3. Timeline and site choice at Orsay**

Achille Stocchi gives a summary of the collaboration efforts and presents a new staging strategy. In addition to the acquisition of the DC gun, photocathode and preparation chamber from RI through a collaboration agreement with IJCLab, iSAS is providing the financial support for the construction of the full LINAC cryomodule (with IN2P3 matching funds and the cold mass vessel coming from ESS). The funding became available as of 1st March 2024 and the bid for the cavity production is already in preparation.

IJCLab has proposed a new project, ERL4ALL, to CNRS which would allow financing the full injection line and parts of a first turn equipment. The project is being led by Maud Baylac and aims for funding of ca. 3.6M€. As already mentioned by Walid, IJCLab is also conducting discussions with Cornell University and HZB for recuperating splitter magnets from C-BETA and the Bessy cryogenic plant for PERLE. In addition, IJCLab is discussing with CERN a collaboration on the 800 MHZ SRF cavity development, with LASA Milan on contributions to the cavities and LINAC cryomodule, booster, DC-gun and photocathode and with JLab on the design of the cavity and HOM absorbers.

The above initiatives lead to a new staging strategy with a first 1-turn, but high current ERL commissioning of a simplified PERLE implementation by beginning of 2028. However, even with the above listed positive steps and initiatives, and assuming that ERL4ALL will receive full funding, the project is still missing ca. 4M€ to fully realize the PERLE 1-tour installation as a first stage. This missing infrastructure could still be realized though in-kind contributions and the PERLE collaboration and IJCLab are actively looking for partners. Potential in-kind contributions include: dipole magnets, cavities for the booster, cryogenic equipment, vacuum pumps and beam diagnostics. The urgent need was stressed by Achille and subsequently by Max for PERLE members to reconsider its contributions to the facility getting successfully realised. Achille also stated that the full 3-turn configuration could be realised without a first 1-turn phase if a missing further about 4M€ could be found in the not too distant future. It is planned to have bilateral meetings of IJCLab and each of the participating partners to discuss the hardware and financial contributions which have been foreseen to be documented in the Collaboration Agreement Appendices.

**4. Activities in Partner Institutes**

LPSC IN2p3: Maud Baylac states that LPSC Grenoble has launched the collaboration with RI on the photogun and photocathode preparation facility delivered to IJCLab; it is involved in the beam dynamics studies of the injector and the estimation of the RF power (Frederic Bouly); and is preparing the funding application to CNRS for ERL4ALL.

Cornell University: Georg Hoffstaetter reports on efforts on software development and plans for X-Light, a light source based on the C-Beta installation.

CERN: Oliver Bruning reports that Frank Gerigk, RF group leader at CERN, expressed his interest to collaborate closer on PERLE related SRF activities in view of the 800 MHz cavity development for FCC-ee.

STFC: Stewart Boogert reports on the grand application period in the UK.

Cockcroft Institute: Deepa Kalinin announces that Boris Militsyn is now working with reduced working hours.

Al-Najah University: Hadil Abualrob on magnet and power supply related activities.

J-Laboratory: Rong-Li Geng reports on the single-cell cavity design and underlines that J-Lab still has the dies of the former cavity production and reports on the J-Lab activities of improving the Q0 of the CEBAF cavities.

JLab: Andrew Hutton reports on the FRT early career award.

iSAS: Jorgen d’Hondt mentions the iSAS @ Orsay kick-off event on April 15th.

**5. Collaboration Matters**

Max Klein proposes that the PERLE collaboration should define a publication format and policy and kicks off a discussion on different options for the PERLE publications. He presented drafts for the publication and authorship policy of the Collaboration, available on the CB indico page, and asked all CB members for possible comments to be sent to Achille and to him during the next weeks, such that a proposal can be presented to the June Collaboration meeting, following a further CB evaluation prior to the meeting. The discussions showed general support. Oliver hinted to the need to also have a note, report, paper structure of PERLE publications. All publications and papers related to PERLE, such as scientific publications presented at conferences and workshops and technical material as eg. for the PERLE installation prior to the publication of a PERLE TDR shall be collected at one platform as the central place repository for all PERLE related materials.

**Action for Achille and Walid**: to define PERLE publication guidelines and to propose a publication platform and repository.

**6. AOB:**

The date of the next PERLE Collaboration meeting is set for 16-19 June with a proposal to hold the meeting at CERN which was endorsed by the CB. A date for the next CB meeting, during the CERN June days or possibly before shall still be chosen.

Oliver Brüning, 12.4.2024