

Special ALICE Management Board, Thursday 30th of April 2020

<https://indico.cern.ch/event/911751/>

VIDYO only meeting

Participants: Harald Appelshaeuser, Federico Antinori, Pietro Antonioli, Roberta Araldi, Alberto Baldisseri, Marielle Charrier, David Chinellato, Andrea Dainese, Barbara Erazmus, David Evans, Alessandra Fantoni, Martino Gagliardi, Jan Fiete Grosse-Oetringhaus, Taku Gunji, Tomas Herman, Yuri Kharlov, Jochen Klein, Alex Kluge, Volker Lindenstruth, Constantin Loizides, Vito Manzari, Silvia Masciocchi, Massimo Maserà, Dariusz Miskowiec, Andreas Morsch, Luciano Musa, Ken Oyama, Yvonne Pachmayer, Stefano Piano, Mateusz Ploskon, Werner Riegler, Kai Schweda, David Silvermyr, Johanna Stachel, Adriana Telesca, Raphael Tieulent, Wladyslaw Trzaska, Marco Van Leeuwen, Pierre Vande Vyvre, 周代翠 (Daicui Zhou)

Absent: Vladislav Manko (excused), Antonino Zichichi (excused)

Introduction – Luciano Musa

A survey of discussions on FoCal that took place within the collaboration has been presented. The list recalled that Letter of Intent has been submitted to the collaboration in July of 2019. The LoI was followed by a number of presentations exposing the proposal: at the ALICE Physics Week in Prague (2019), at plenary sessions within ALICE Weeks (August and November in 2019, and March of 2020), as well as at several Physics Forums. The discussion on the FoCal detector integration at the Technical Board took place in September 2019. An ALICE internal review of the proposal took place on 14th of January 2020. The review panel included external referees. The Upgrade Coordination has distributed the report and concluding remarks. FoCal was discussed at the Management Board in January 2020. The discussion resulted in a decision to postpone the decision on the endorsement. The main points awaiting resolution were: the pending quantitative performance comparisons with LHCb and the impact of FoCal on Service Work and the M&O support for existing detectors. Between January and the present day, the comparative studies with LHCb have been carried out and with updates presented at MB meetings.

The focus of today's meeting is to:

- a) Present the latest update on the FoCal performance vis-à-vis the recent LHCb studies that will become available as a public note.
- b) Present an update on resources to become available to FoCal by the contributing institutions.
- c) Discuss an estimation of Service Work generated by FoCal M&O.
- d) Discuss the recommendations and comments from the Physics Board, Technical Coordination, and Upgrade Coordination.
- e) Consider any other remarks by MB members and potential approval of the project by the MB.

FoCal – Updates / Collaboration / Resources – Constantin Loizides

The FoCal-LHCb comparisons have now been largely concluded. The central outcome is that FoCal's performance quantified in terms of relative uncertainties on direct photon measurements is superior as compared to LHCb by factors of larger than 2 (up to about 2.5). This positions FoCal as a unique device at the LHC to significantly constrain nuclear PDFs at small- x ($x < 10^{-4}$) for Q^2 of about 10 GeV². A comprehensive summary of the comparison studies has been offered in the slides by the Upgrade Coordination. This has been compiled using the discussion that took place at the Physics Forum on the 29th of April 2020 (<https://indi.to/2LyNz>) and the discussion by Upgrade Coordination presented at the Physics Board on the 9th of April 2020 (<https://indi.to/4jkXC>).

The current version (rev. 5751) of the LoI has been uploaded to the indico pages. FoCal collaboration reported that a number of new institutions have shown interest in formal participation in the project. In particular, at this point the complete ALICE-Norway has joined the project. INR RAS and NRNU MEPhi have proposed their involvement in adaptation and integration of the FIT setup in Run-4. All groups from ALICE-Brazil have joined the project. Yonsei University participates in the development of the project. The work on prototypes with an aim at a Technical Design Report continues. A layout of the potential project – including institutional responsibilities - has been presented within the slides. A list of key requests to national funding agencies with an estimate of funding organized by countries has been summarized. The estimated cost includes about 1M CHF from ALICE common funds – related to the necessary adaptation of the infrastructure at the interaction point in the view of the new instrumentation.

Concerning the responsibilities of the institutions involved in FoCal a number of considerations has been brought up:

- All of the institutes involved in the proposal have reconfirmed their commitment to M&O of ALICE detectors through LS 2, Run 3, and Run 4. It is expected that the newly organized service work will ensure the proper execution.
- The technical workforce needed in the R&D and construction phase of the project is mainly composed of ALICE members that are not directly involved in commissioning and/or operations of the detector – with many not being M&O-A members of the collaboration. It was noted that in a number of institutions the new funding opens up possibilities to hire workforce from outside ALICE (new temporary hires from the so-called matrix organizations within laboratories).
- The funding agencies of the leading institutions in USA and Japan have a longstanding understanding of M&O-B support for experimental projects and the same stance should be expected for FoCal. Also, other leaders in the project (Bergen, Copenhagen, Grenoble, Sao Paolo, Wuhan) restated their ongoing responsibilities in accord with support for FoCal.
- The expected impact on the Service Work related to FoCal is expected to resemble a footprint of EMCAL that sums up to about 5% of total service tasks within ALICE.

A summary of the perspective on preparation of the Technical Design Report has been presented. At present, it is expected that the US institutions will take the lead in the project as they are key responsible in the overall integration of the detector components. The team that led the US part of the TPC and ITS upgrades is available. While the discussions with the US funding agency (Department of Energy) continue, the more formal approach will be adequate once the project receives endorsement by ALICE and the LHCC. A summary of the workforce outside USA related to particular detector components (PADs, PIXELs, HCAL, FIT/integration) has been given in terms of available FTEs.

Comments from Physics Coordination, Technical Coordination, and Upgrade Coordination – Andrea Dainese, Werner Riegler, Jochen Klein, and Marco van Leeuwen

Physics Coordinator reported on Physics Board deliberations. The PB concluded with a strong recommendation in favor of FoCal stating its physics case centered on the study of gluon density in nucleons and nuclei at small-x as compelling and recognized FoCal's uniqueness at the LHC. In particular, PB highlighted the superior performance in constraining the nuclear PDFs at small-x by FoCal as compared to LHCb. In addition, PB recommended to stress and detail in the TDR the uniqueness for the three legs of the physics programme (e.g. azimuthal correlations in p-Pb, long-range correlations in p-Pb and Pb-Pb, jets and Ultrapipheral Collisions in Pb-Pb).

Upgrade coordination reiterated on their strong, positive evaluation and recommended the project to be endorsed. A dedicated clear summary of the studies comparing FoCal with LHCb has been attached to the meeting's page. The main outcomes have been already summarized above.

Technical Coordination reminded the outcome of the Technical Board from September 2019 (<https://indi.to/Xb3Ry>) detailing the implications of FoCal installation. Despite the complexity of those the TC is favorable to the feasibility of the necessary rearrangements, modified workflows, and successful installation and operations. On the technology side the TC found the detector interesting and welcomes the work on the project.

Discussion

MB recognizes that the project proposal enters a critical phase. The endorsement by the MB, followed by the potential approval by the CB, and subsequent potential positive recommendation of the LHCC provides the necessary setup for formal requests for funding to the national funding agencies. While the MB recognized the uncertainties related to the funding of the project (some key funding either pending or awaiting formal approval processes) the board agreed that the current considerations are adequate for this stage of the approval status within the collaboration and CERN's LHCC. The MB appreciated that the upcoming 6-12 months will be critical with a TDR being key milestone for the project. Concerns related to COVID-19 were also expressed; however, here the overwhelming conclusion was that the uncertainties in scheduling affect not only FoCal, but also, the overall LHC schedule in the coming years and any attempt of projecting at this point would be premature.

Members of the MB expressed interest in improving/strengthening FoCal simulation results in several areas: a) bringing the background simulation to the same footing with LHCb (HIJING vs. EPOS generator); b) quantifying the studies on the reach towards lower photon transverse momenta – correlated with the expectations on the onset of saturation. While none of the above is expected to alter the main conclusions on the physics case the work on the simulations continues and updates are expected to follow – some, likely in time for the anticipated discussions with the LHCC.

Decision

The Management Board welcomed the updates on the project, opinions of the specific coordination teams, and the recommendation from Spokesperson to endorse the project. Given these inputs, and also including the updates on the physics case and the review of the resources presented by the project – the MB endorsed the FoCal project with a recommendation to the Collaboration Board to endorse its Letter of Intent allowing for its formal presentation to the LHCC. No opposing opinions were presented.

Comments from Collaboration Board Chair – Silvia Masciocchi

A special meeting of the Collaboration Board to discuss and potentially endorse the FoCal will be called to take place on 15th or 22nd of May. Logistics of the meeting – including the potential vote – have been discussed. It was agreed that the MB recommendation accompanied by appropriate materials will be made available to the CB by May 8th, 2020. An approval will require a positive vote majority of 2/3 of the eligible voting members (68). MB members were inclined to have the meeting on 15th of May as it allows for more flexibility in planning potential discussions with the LHCC – in particular a pre-LHCC week meeting dedicated to FoCal. The 142nd LHCC meeting is to take place in the week of 1st of June 2020.