

Minutes of the meeting on the CREMLINplus WP7 detector school

Meeting of 16/9/2020 via ZOOM

<https://indico.cern.ch/event/940934/>

Attending: Cesar Ceballos, Otilia Culikov, Dominik Dannheim, Nicola De Filippis, Michael Düren, Jürgen Eschke, Richard Hall-Wilton, Sergey Kononov, Lucie Linssen, Yuri Murin, Margherita Primavera, Christian Schmidt, Mustafa Schmidt, Vitaly Vorobyev

Excused: Simon Spannagel

Agenda Items (see slides posted on indico):

General introduction, and ideas from BINP, *Sergey Kononov, Vitaly Vorobyev;*

Ideas from ESS, *Richard Hall-Wilton;*

Ideas from Giessen, *Michael Düren, Mustafa Schmidt;*

Ideas from GSI, *Christian Schmidt; Jürgen Eschke;*

Ideas from INFN Bari and INFN Lecce, *Nicola De Filippis, Francesco Grancagnolo, Margherita Primavera;*

Ideas from JINR, *Otilia Culikov; Sergey Kulikov, Yuri Murin;*

Ideas from CERN, *Dominik Dannheim, Lucie Linssen;*

Jürgen Eschke gives feedback from the CREMLINplus Executive Board:

- It is possible to apply in a GA Amendment to postpone the date of the school, however it is important to fix a new provisional date.
- It is discussed in the EB, if funds from CREMLINplus WP9 can be made available for the school.

Date of the school:

Due to the Covid-19 situation, one cannot be sure precisely when the school can take place. Due to availability of teachers and students at BINP, the local organisers propose the period of July/August 2021. Further input will be collected from all parties (by Sergey and Lucie) after the meeting and subsequently a provisional date will be fixed.

Duration of the school:

Proposals mentioned vary from 7 days to 3 weeks. We conclude on a duration within the range 10 days – 2 weeks.

Scope of lectures and student exercises:

As agreed at the meeting in February, the school will have a broad scope including ion/nuclear physics, particle physics and neutron physics. Similarly, concerning the various types of detector technologies, there is a preference for exposing the students to a wider scope, both for the lectures and for the student exercises. The list of lecture subjects presented by Sergey Kononov seems adequate (slide 7, Tracking, Calorimetry, Silicon detectors, Neutron detection, Particle identification, Photodetectors, Gaseous detectors, Electronics, Trigger and Data Acquisition, complemented with additional information on experiments at the BINP host). It is proposed to also include the following subjects (in

lectures and/or exercises): ASIC design, FPGA programming, Test beam analysis. The aim is to have approximately 50% lecturers from Russia and 50% from EU countries.

It is felt that the longer student exercises, proposed in the slides of Vitaly Vorobyev, are not compatible with this wider approach, and additionally risk to be too labour-intensive for the supervisors.

Furthermore it is proposed to include a historical presentation on one particular detector (e.g. TPC), showing how the detector evolves from the design stage and its targeted requirements to the real installed detector, followed by the evolution of its performance through optimisation of the detector operation and data analysis.

Hands-on exercises involving hardware material:

Sending hardware to BINP may add complication due to e.g. custom formalities, though Sergey mentions that there is an established procedure for temporary importation. Solutions will be explored to minimise the transport of material, e.g. by using common items, like power supplies, directly available at BINP. The aim is nevertheless to include student exercises from all institutes participating in the organisation (ideally in a ratio 50% of the exercises from Russia and 50% from EU countries). As a result, material will have to be sent well in advance.

Composing an initial programme of lectures and student exercises:

Several institutes have provided slides comprising proposed offers for lectures and student exercises. In addition there was further oral reporting at the meeting by ESS (offering help with neutron detectors, preferably not sending ESS material but rather helping another institute that plans to supply neutron detection exercise material) and GSI (offering to provide student exercises on silicon detectors and MAPS). Giessen additionally mentions Netzwerk Teilchenwelt CosMO boxes for cosmic ray exploration.

It is proposed that Sergey and Lucie study the material presented at the meeting and collect further details from the organising institutes in order to compose a preliminary programme for up to 50 students.