 – Protocol		<b>Nr.: 21.10.2019, 10:00 – 12:00</b>																																														
<b>Machine Meeting (MM)</b>		<b>Chair: M. Bai</b>																																														
<b>Distribution</b>	Machine coordinators and their deputies, departments leaders accelerator, participants, Management board																																															
<b>Participants</b>																																																
A. Adonin	<p><u>Attendees</u></p> <table border="1"> <tr> <td><input type="checkbox"/> Stephan Reimann</td> <td><input checked="" type="checkbox"/> Markus Vossberg</td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> P. Schuett</td> </tr> <tr> <td><input type="checkbox"/> Ralph Hollinger</td> <td><input type="checkbox"/> Klaus Tinschert</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Fabio Maimone</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lars Groening</td> <td><input type="checkbox"/> Sascha Mickat</td> </tr> <tr> <td></td> <td><input type="checkbox"/> M. Kaiser</td> </tr> <tr> <td><input type="checkbox"/> Gerald Schreiber</td> <td><input checked="" type="checkbox"/> Bernhard Schlitt</td> </tr> <tr> <td></td> <td><input type="checkbox"/> A. Schnase</td> </tr> <tr> <td><input checked="" type="checkbox"/> Markus Steck</td> <td><input type="checkbox"/> Danyal Winters</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Sergey Litvinov</td> </tr> <tr> <td><input checked="" type="checkbox"/> Frank Herfurth</td> <td><input type="checkbox"/> Zoran Andelkovic</td> </tr> <tr> <td><input type="checkbox"/> Christina Dimopoulou</td> <td><input type="checkbox"/> Jon Roßbach</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Regina Heß</td> </tr> <tr> <td><input checked="" type="checkbox"/> Winfried Barth</td> <td><input type="checkbox"/> S. Yarmychev</td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> Hartmut Vormann</td> </tr> <tr> <td><input type="checkbox"/> Gertrud Walter</td> <td><input type="checkbox"/> Kalliopi Dermati</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Markus Romig</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Stephan Teich</td> </tr> <tr> <td><input checked="" type="checkbox"/> Udo Weinrich</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> D. Serverin</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> M. Sapinski</td> <td><input type="checkbox"/> C. Hessler</td> </tr> <tr> <td><input checked="" type="checkbox"/> Peter Spiller</td> <td><input type="checkbox"/> Jens Stadlmann</td> </tr> <tr> <td><input type="checkbox"/> Markus Schwickert</td> <td></td> </tr> </table> <p style="text-align: right;">*Types: A = Action, D = Decision, I = Information</p>	<input type="checkbox"/> Stephan Reimann	<input checked="" type="checkbox"/> Markus Vossberg		<input checked="" type="checkbox"/> P. Schuett	<input type="checkbox"/> Ralph Hollinger	<input type="checkbox"/> Klaus Tinschert		<input type="checkbox"/> Fabio Maimone	<input checked="" type="checkbox"/> Lars Groening	<input type="checkbox"/> Sascha Mickat		<input type="checkbox"/> M. Kaiser	<input type="checkbox"/> Gerald Schreiber	<input checked="" type="checkbox"/> Bernhard Schlitt		<input type="checkbox"/> A. Schnase	<input checked="" type="checkbox"/> Markus Steck	<input type="checkbox"/> Danyal Winters		<input type="checkbox"/> Sergey Litvinov	<input checked="" type="checkbox"/> Frank Herfurth	<input type="checkbox"/> Zoran Andelkovic	<input type="checkbox"/> Christina Dimopoulou	<input type="checkbox"/> Jon Roßbach		<input type="checkbox"/> Regina Heß	<input checked="" type="checkbox"/> Winfried Barth	<input type="checkbox"/> S. Yarmychev		<input checked="" type="checkbox"/> Hartmut Vormann	<input type="checkbox"/> Gertrud Walter	<input type="checkbox"/> Kalliopi Dermati		<input type="checkbox"/> Markus Romig		<input type="checkbox"/> Stephan Teich	<input checked="" type="checkbox"/> Udo Weinrich		<input checked="" type="checkbox"/> D. Serverin		<input checked="" type="checkbox"/> M. Sapinski	<input type="checkbox"/> C. Hessler	<input checked="" type="checkbox"/> Peter Spiller	<input type="checkbox"/> Jens Stadlmann	<input type="checkbox"/> Markus Schwickert		
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<b>Important:</b> <b>I = Information</b> <b>D = Decision</b> <b>AI = Action Item</b>		<b>Confidentiality Notice</b> <b>It is requested not to scatter the protocols over the predetermined distribution circle or leave them on the publicly available printers.</b>	
<b>1</b>	<b>Agenda</b>  1. Approval of meeting minutes 2. Follow-up of action items <ul style="list-style-type: none"> <li>• U5+ status update: Adonin</li> <li>• Proton beam operation with UNILAC</li> </ul> 3. Status update		
<b>2</b>	<b>Update</b>  <b>U5+ status:</b> in principle works. For more details, <a href="http://indico.gsi.de/event/9588/contribution/10/material/slides/0.pptx">http://indico.gsi.de/event/9588/contribution/10/material/slides/0.pptx</a>  <b>UNILAC:</b> <a href="http://indico.gsi.de/event/9588/contribution/9/material/slides/0.pptx">http://indico.gsi.de/event/9588/contribution/9/material/slides/0.pptx</a> Overall progress well despite the LINAC RF controls' hiccup in HKR hindered the HSI RFQ conditioning over the weekend. At the moment, HSI RFQ and Alveraz are ready for Ar beam,  Issues regarding pulsed gas stripper and UNILAC UHV upgrade were briefly reported. The gas stripper is not yet working and the UNILAC UHV upgrade is delayed due to the controls issue  <b>ESR:</b> <a href="http://indico.gsi.de/event/9588/contribution/11/material/slides/0.pdf">http://indico.gsi.de/event/9588/contribution/11/material/slides/0.pdf</a>  <b>CRYRING:</b> no issues  <b>Operations:</b> <a href="http://indico.gsi.de/event/9588/contribution/4/material/slides/0.pptx">http://indico.gsi.de/event/9588/contribution/4/material/slides/0.pptx</a> The engineering run plan is now updated		

No reports from SIS18, HEST and FRS

PSU: no major issues. details at <http://indico.gsi.de/event/9588/contribution/3/material/slides/0.pdf>


cw-linac demo: no major issues. details at

<http://indico.gsi.de/event/9588/contribution/14/material/slides/0.pptx>

AP0: <http://indico.gsi.de/event/9588/contribution/1/material/slides/0.pdf>

**3 Discussion All**

Proton operation mode:

- Highest proton intensity in SIS18, and extraction to users
  - setup time for accelerating H+ through UNILAC, and feasibility of parallel operation
  - History:
    - What has been demonstrated from MD point of view
      - UNILAC potentially can deliver much more than  $8e10$  per spill on target, while during beam time nobody requested for more.
      - If we are talking about beam on target intensities to be delivered, the losses inside SIS18 have to be taken into account.
      - Parallel mode with proton beam at poststripper is in principle possible, if mass to charge ratio of the second beam is low enough. For this you need high charge state and/or low masses.
      - Parallel operation with carbon and calcium ( $10+$ ) beam is in any case possible, if one would choose the right carbon charge state.
      - The carbon intensity depends on the charge state, the choice of ion source, the stripper target and so on
      - UNILAC definitively is not able to deliver 30% of the FAIR-proton-Linac design intensity. But the high current proton beam emittance (norm.) at UNILAC is significantly lower as for p-Linac. As a result 30% of the Proton-FAIR performance potentially could be reached inside SIS100 (see PRAB-publication attached). This beam intensity was not delivered to user so far – the beam times for D. Varentsov had been performed with lower intensity. The maximum proton current accelerated in SIS18 was measured as  $2.1 \times 10^{11}$
- 
- PhysRevSTA  
B.15.0542...
- from user's point of view
    - In July 2014 we recorded in OLOG: p+ made from CH3 from MUCIS parallel to Carbon from ECR
    - The p+ beam has been delivered to FRS users ( $8,2E10$  per spill @ target), to ESR ( $2,1E9$  per spill) and HHT ( $8,5E10$  per spill @ target) for about one week in block mode.
    - In 2015 I found a test run towards Y7 with protons from Isobutan 4C10H
    - In 2016 we recorded in OLOG: CH3 from CORDIS, 18 days of operation, parallel to 48Ca from ECR. It looks like some experiments took the Carbon-part, but the Protons have not been delivered to the users.
  - slides from W. Barth on the proton beam from UNILAC can be available at <https://indico.gsi.de/event/9588/contribution/5/material/slides/0.pdf>
  - In summary,
    - Proton from UNILAC has been demonstrated in the past. Two basic modes of its operation
      - H3+ : limited intensity ( $0.085\text{mA}$  at TK, typical intensity in SIS18  $< 1e10$ ), allows parallel operation up to  $A/Q=6$
      - CH3+: high intensity (upto  $2\text{mA}$  H+ at TK, upto  $2e11$  protons reached during dedicated machine development), but rather limited parallel operation ( $A/Q \leq 2$ ).
        - The p+ beam has been delivered to FRS users ( $8,2E10$  per spill @ target), to ESR ( $2,1E9$  per spill) and HHT ( $8,5E10$  per spill @ target) for about one week in block mode: 2014
    - Dedicated test period is planned at end of 2020 beam time
      - SIS18 slow extraction at beam energy of  $4.5\text{GeV}$
      - Test LINAC RF setting for protons

**4 Open Action items**

- Follow-up of UNILAC gas stripper and UHV upgrade w.r.t beam time: H. Vormann/P. Gerhard

H. Vormann/P. Gerhard

**Any other business**

- Next Machine Meeting: Oct. 29, 2019