

# Minutes of the ISOLDE Physics Group Meeting, 13/09/2017

## Technical news

- **GPS**
  - The week was shared between collections for medical purposes/bio physics and beam development with RILIS/ISOLTRAP. Target # 565 Ta performed well.
  - Last week's operation was smooth although the problem with switching off of different electrostatic elements (CA0) persisted. On a couple of occasions this could be correlated to a vacuum glitch but otherwise their powering off seemed to be random.
  - On Wednesday evening the power in the electrical cupboard with the GPS/HRS power supplies tripped due to an imbalanced distribution.
  - The lack of beam diagnostics in the vertical plane makes setting up the machine difficult.
  - Target #611 UC2-C was installed on Monday for 94Rb beam to Miniball. During the installation there was a problem with the robot which picked up the target in a wrong way, requiring manual intervention.
  - There will be a technical stop on 18<sup>th</sup> and 19<sup>th</sup> September.
- **HRS**
  - Ni beams were available for COLLAPS from the end of the week. Earlier in the week, stable surface ionized beams could be used for setting up.
  - The power supply of QP330 was broken and exchanged.
  - On Tuesday night there was a problem with the transmission through the cooler which suddenly dropped and which could only be restored by changing the high voltage on the cooler by 10V. The same problem occurred later in the night, but was self-restored after few minutes. This problem is not understood but was not seen later on in the run.
  - When putting protons on target, note that it is not possible to send 0A to the last dipoles in the BTY line as in reality this results in 40 A being sent. The solution is to send 0.01A.
  - At LA2, the plan was to install prototype scanners which should replace the wire scanners throughout ISOLDE. Unfortunately, the scanners were 1 mm too big and the installation was postponed.
- **REX/HIE ISOLDE**
  - On Tuesday, there was an intervention to investigate the water flow meter problems which were experienced in the last weeks.
  - For the first time, all superconducting cavities will be running together for the run on  $^{94}\text{Rb}^{23+}$ .
  - With a beam energy of 6.3 MeV/u, it will be the highest energy beam at which HIE-ISOLDE has operated so far.

- **RILIS**

- It has been a busy week for RILIS providing Dy schemes for collections in the night while alternating between Sc, Se and Ti schemes for TISD during the day. Although difficulties in producing and measuring Ti and Se beams were encountered, the Sc beams were quite successful with measurements being done on  $^{46-50}\text{Sc}$ .
- Due to a delay in the preparation for collections on Wednesday night and a misunderstanding in the planning, the switchover to Ni could not be done until Thursday evening. Due to a lack of time, the Ni scheme, using the green laser, was not optimized. On Saturday, the green laser was swapped with the TiSa laser and, with some fine tuning by B. Marsh, a clear improvement of a factor of 10 could be gained.
- The two photon spectroscopy initially planned had to be postponed due to the inability to operate the designated TiSa laser in the RILIS lab.

## Physics

- Collections for medical purposes and biophysics went well.
  - The samples are shipped to various institutes, we will still have to wait a couple of weeks for the outcome.
  - The new chamber and procedures for collections worked well. This promises an active medical program next year.
  - $^{172}\text{Lu}$  and  $^{138}\text{Nd}$  were implanted in solutions and foils for PAC measurements for biophysics. In addition  $^{160}\text{Ho}$  and  $^{149}\text{Gd}$  were also collected, but in a more exploratory manner to test their suitability for future experiments.
- The COLLAPS run on Ni experienced problems due to low yields.
  - The plan was to start with protons on the neutron convertor to study neutron-rich Ni, in particular to remeasure  $^{70}\text{Ni}$  and extend the data to  $^{69,71,72}\text{Ni}$ . Unfortunately, yields were too low so it was decided to put protons on target to study neutron-deficient  $^{56}\text{Ni}$  and  $^{57}\text{Ni}$  and to improve the yields of the neutron-rich (with the disadvantage of greatly increasing the Ga contamination).
  - While there was a 20 fA RILIS ON/OFF effect on  $^{56}\text{Ni}$  during the weekend, no resonance in the hyperfine spectrum could be observed. A check of the beam composition on mass 56 was performed on Tuesday by ISOLTRAP revealing only very little  $^{56}\text{Ni}$  (few 100/s), but at that time no RILIS/ON effect was seen anymore.
  - The results on  $^{70}\text{Ni}$  still need a proper analysis before anything can be concluded. Nevertheless nothing more exotic could even be attempted with these yields.
- Next week a miniball run with  $^{94}\text{Rb}$  will be performed to study excited states

around  $^{212}\text{Pb}$ .

- It is expected that using multinucleon transfer reactions 16+ isomers in Mercury isotopes can be populated which weren't seen in the fragmentation reactions at GSI before.
- It is expected that also a low-lying 3- octupole deformed state in  $^{210}\text{Hg}$  will be populated.
- Stable beams should be delivered to VITO on Tuesday for the beta-NMR run using Na in liquid samples.

## **Safety**

- RP and EP safety were very happy with how the collections went. The use of the new, well-shielded collection chamber resulted in a total dose of only 14  $\mu\text{Sv}$  throughout the run.

## **Visits**

- There will be a visit of a CERN intern on Thursday 14/09. People wanting to join for a coffee afterwards (~15:00) are welcome.

## **AOB**

- All contaminated material was removed from the old labs/new offices in building 3.
- From now on until the end of the year, the MEDICIS interlocks will be tested as preparation for next year. A new VISTAR with a box for MEDICIS will be released.
- The preparation works on the air conditioning in the ISOLDE hall will start this week. The crane might be locked for this.
- For the European Researcher's Night on Friday 29<sup>th</sup> September, Karl is still looking for volunteers to help representing ISOLDE (part) of the event. French speakers are particularly encouraged to participate.

Minutes by H. Heylen.