Minutes of the ISOLDE Physics Group Meeting, May 17th 2017

There were no comments to the minutes of the last ISOLDE PGM.

Technical news

- **HRS**
  - The CRIS experiment studied indium isotopes from HRS until Thursday. It was followed by the GPS run, which used the UC_x target of the previous IDS experiment, also on indium isotopes (see Physics and schedule).
- **GPS**
  - During the setup phase of GPS it was noticed that the extraction electrode still has the problem of randomly moving by itself to full in position. This is an issue to keep in mind for all future experiments on GPS. It poses a great risk, because it can potentially crash into the front-end valve and produce serious damage. So far every time Christoph Mitifiot could fix the problem, even remotely, but so far no permanent solution was found. Tim will meet with Christoph, there is a need to be able to fix this problem when Christoph is not reachable, and also to identify the cause of the problem in the first place.
  - The power supply of the GPS magnet required a reset, but apart from that there were no major issues with the separator setup. ISOLTRAP ran on this target until Monday morning (see Physics and schedule).
  - One technical issue occurring during the run was related to the GPS user beam gate. Some confusion was created by the fact that beam is observed on the FC490 Faraday cup even when the beam gate is closed. This was falsely interpreted as a broken beam gate, which determined the operations team to move the user control trigger to the main ISOLDE beam gate. This beam gate is not meant to be controlled by the users, it is simply in place to automatically block the beam during the recovery of the voltage after the proton impact. It would be very helpful to users (and operators alike) to have a schema showing not only the ion-optical elements, but also the Faraday cups and beam gates. It would also reduce the risk of confusion if the user beam gate was not labelled “Main” in the control room.
  - ISOLTRAP reported that the GPS mass factor does not allow correctly cycling the magnet over the full mass range. Between A = 50 and A = 200 three different mass factors had to be used and time was spent in order to fine tune the mass factor for the isotope of interest. This becomes especially crucial if one studies exotic nuclides. One solution would be to change the scaling formula in order to correct the mass-factor drift over the desired mass range. The performance of the wire scanners on the central beam line is currently also not very good, with low refresh rates, non-intuitive current scales and artefact images of peaks which are not there.
- **REX/HIE-ISOLDE**
  - The HIE-ISOLDE commissioning continues. Alberto continues preparations with A/q = 4 beams. The transmission through REX is still relatively low, only 65%.
  - There was an issue with some of the high-energy beam-steering magnets. The cooling water of the magnets was turned off by someone and this led to an emergency stop of the power supplies.
  - A few HIE-ISOLDE power supplies were replaced.
- **RILIS**
  - The indium ionization for IDS and CRIS went well.

- A titanium ionization scheme was set up on Thursday night for ISOLTRAP while switching towards tellurium. The schemed performed well but there was not enough radioactive titanium to use for physics.
- The tellurium tests were difficult. First of all, the tellurium which had been placed in one of the target ovens as mass marker was either not in the oven specified in the target file, or it had been emptied due to some residual heating during the weeks in which the target was on.
- Apart from the mass-marker problems, there were also some issues on the RILIS side. The optical path was lost during the week-end, which required re-adjusting, and at one point the focusing of a laser beam was so strong that one of the crystals broke. The tests will probably be re-scheduled following the Mössbauer run.
- Due to the problems with the tellurium tests, there was not time and resources for the selenium program.

- **Targets**
  - STAGISO tests were performed on both target front ends on Monday and Tuesday. This new way of beam delivery has a chance to increase the target lifetime for experiments with neutron converters.
  - The carbon nanotube target for the boron run is ready. The titanium foil target for the magnesium run is currently being installed.

Physics and schedule

- The CRIS run might have suffered from the accidental venting of the front-end when the HRS window was replaced. The ratio of contamination to ion of interest was much higher than expected. Nevertheless, CRIS successfully measured the hyperfine structure of neutron-rich indium isotopes and isomers up to A = 131, including the test of two different transitions, allowing to probe either the magnetic or the electric properties of the nucleus (a first for CRIS).
- The ISOLTRAP run on neutron-rich argon and krypton isotopes could not take place. Using the UC_x target from the last IDS run, it was attempted to measure neutron-rich titanium, strontium or to check some of the Q-value pairs of interest for neutrino physics. Nevertheless, on none of these cases the yields were sufficient for a study to be performed. Instead, the program was dedicated to perform the first high-precision PI-ICR Q-value measurement with ISOLTRAP, a necessary test for the later experiments. The test pair was ^{88}Rb-^{88}Sr and the result was positive.
- The following run will take place on GPS (GHM) and it will study by emission channeling the behavior of magnesium as a dopant of GaN semiconductors. One important focus of this measurement is understanding the fraction of interstitial Mg in GaN, which is poorly understood and though to be a limiting factor of the performance of device using this type of semiconductor.

Safety

- The beam permit for HIE-ISOLDE might be signed next week. For the last inspection it is recommended to tidy up the extension area. Karl will write an e-mail to schedule a common action.

AOB

- The CERN relay race will take place on Thursday, 1st June.

Seminar

– The meeting was followed by the third and last part of the lecture series on giant resonances by Angela Bracco from the University of Milano and INFN.

The next PG meeting will take place on Wednesday, May 24th, at 14:00. It will be followed by the seminar of Simon Lechner from TU Vienna on "Proton therapy simulations at MedAustron".

Minutes taken by VM