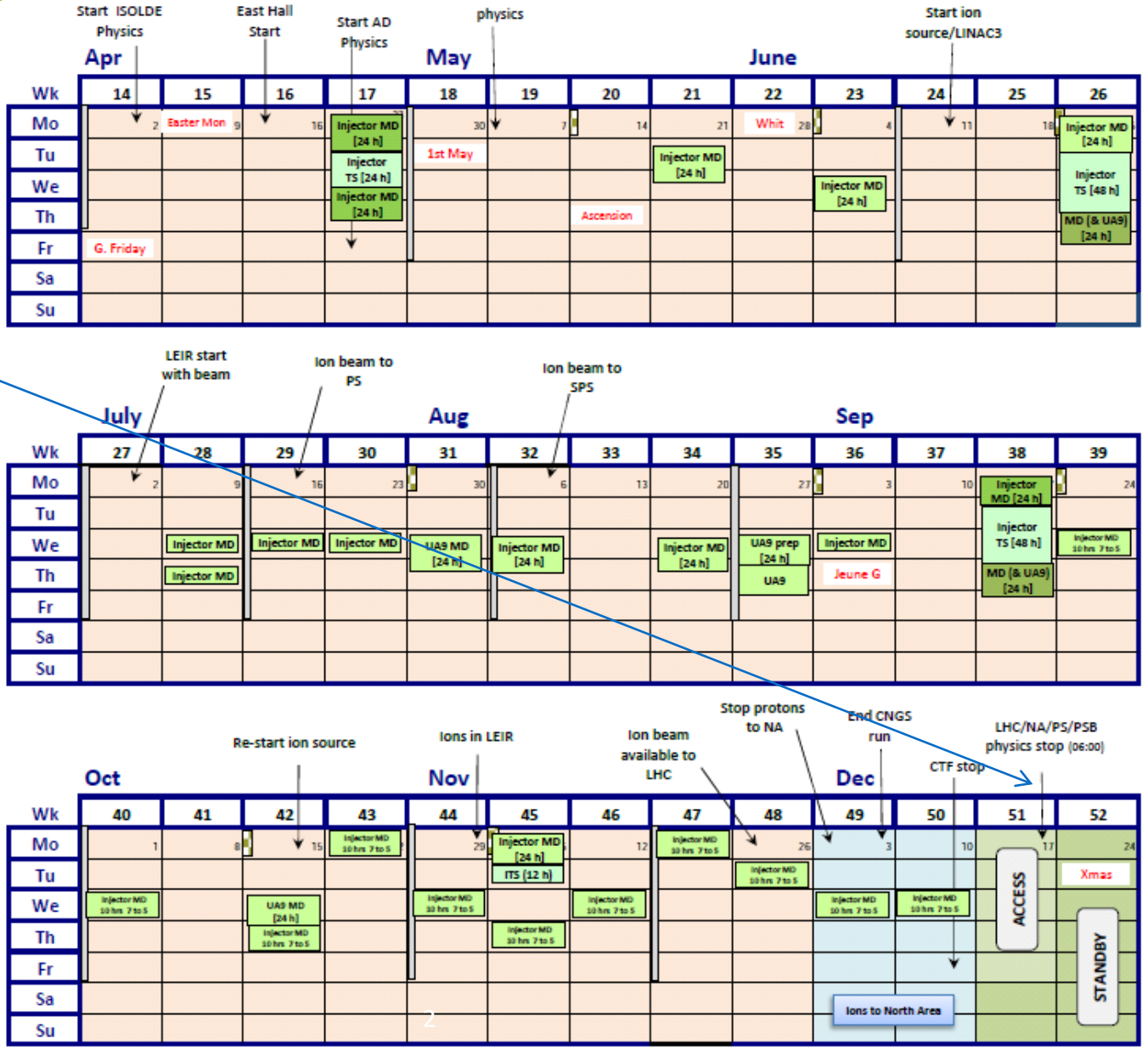
ISOLDE Physics Report

Magdalena Kowalska

Injector schedule since last meeting

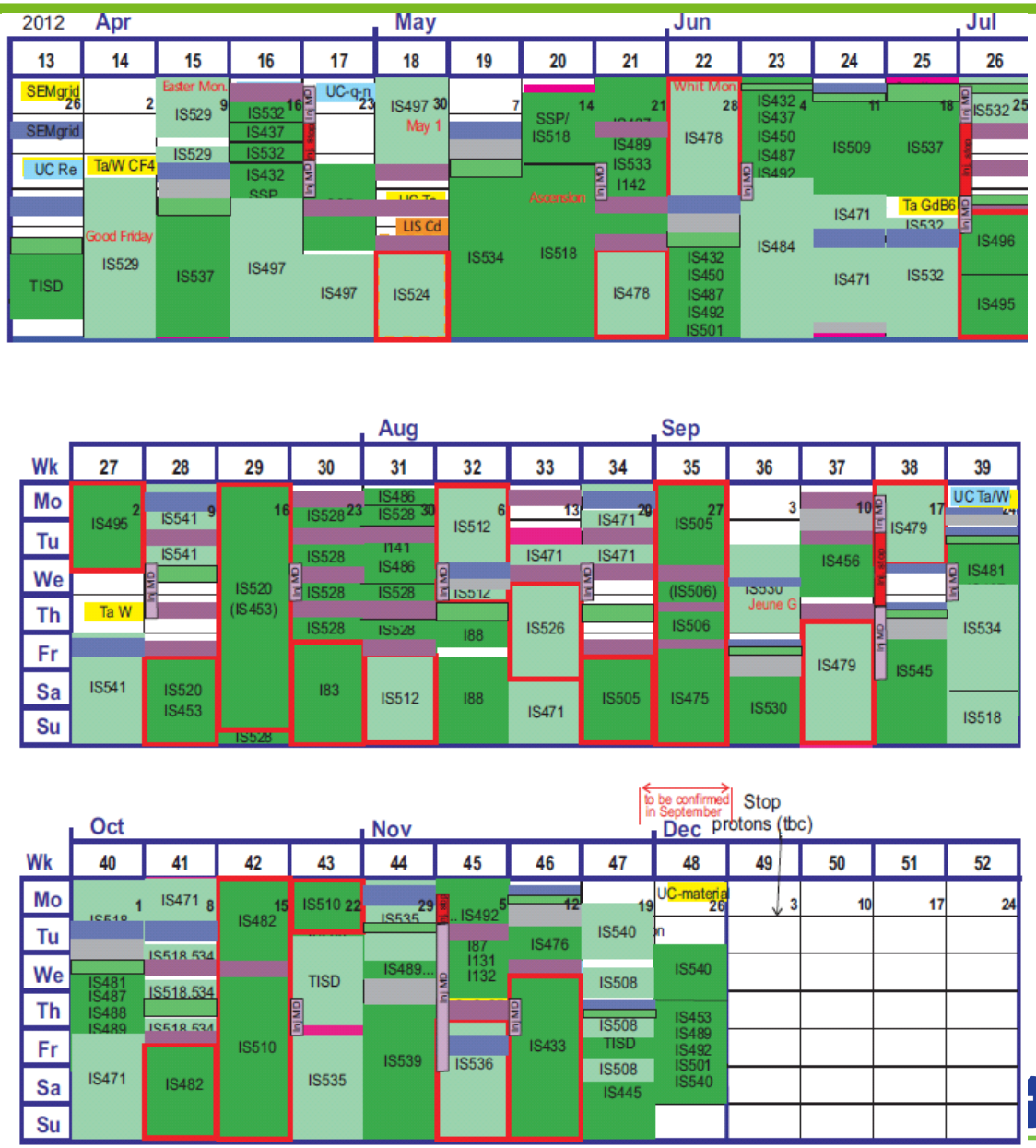
September: confirmation of 2 more weeks with protons – until December 17th: 35 -> 37 weeks of physics (vs 29 weeks in 2011)

physics started April 2
protons stop Dec 17



Running period 2012

ISOLDE program 2012
Status mid-october
(schedule v3.0):



ISOLDE schedule – Oct 26th

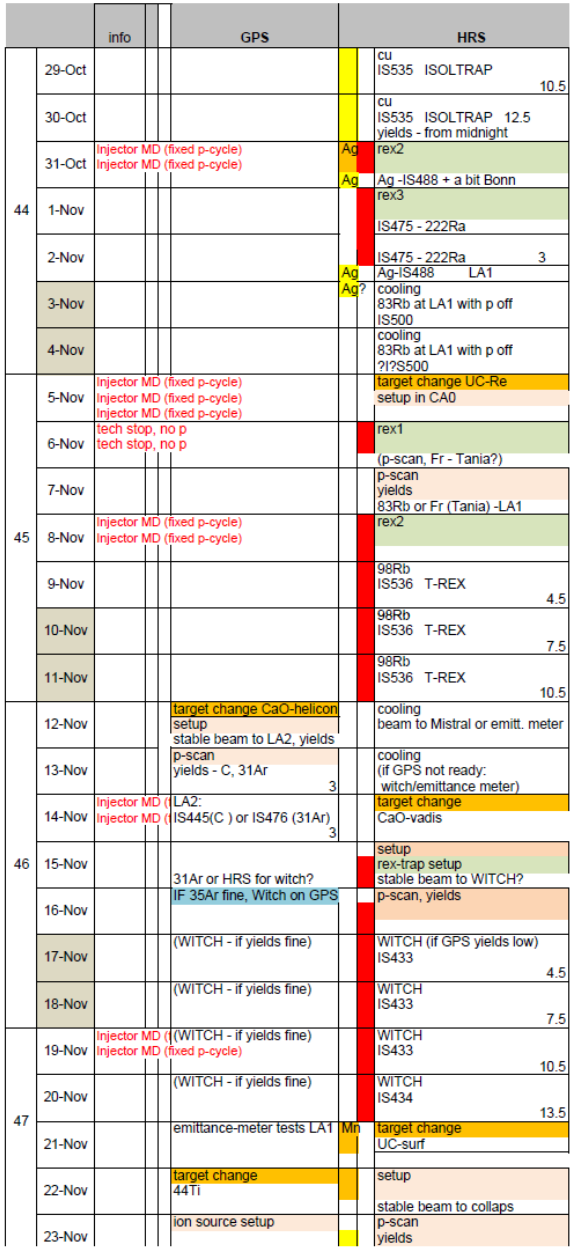
Mid-October: GPS problem - extraction electrode stuck in the middle of target valve -> only light targets allowed

=> new ISOLDE schedule
v4.0, 26th Oct:

- All GPS runs rescheduled (some shifts cut), partly in 2 additional weeks
- Failed summer run (11Be) also rescheduled
- CaO and offline 44Ti on GPS

⇒No IS experiment cancelled
(3 collection LOIs cancelled)

Usual pdf version under preparation



Shifts 2012

Shift balance: 1009 open shifts for IS experiments, 53 shifts for LOIs

- Shift requests: 833 shifts for 71 IS exp vs 657.5 in 2010; 40 shifts for 14 LOIs
- 20 IS experiments with no beam requests
- REX requests: 377.5 shifts (IS + LOIs)

Scheduled runs (since July – 2wk prolongation & GPS problem):

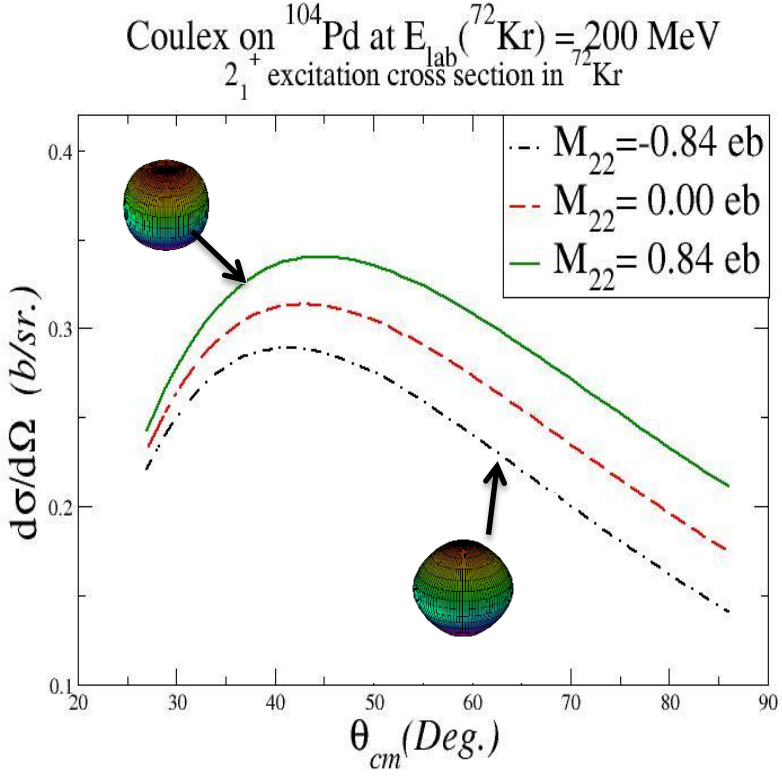
Scheduled	Oct 2012	July 2012	2011
All shifts (IS+LOI+MD)	565	579	491.5
Shifts for IS exp	539	537	440
Shifts for LOIs	26.5	36.5	
# of IS exp	51	53	
# of LOIs	10	13	
REX runs & exp	11 - 17	11 - 17	10? - 14
REX shifts (IS +LOI)	221.5	220	190.5
Average shifts/day	2.08	2.42	2.31

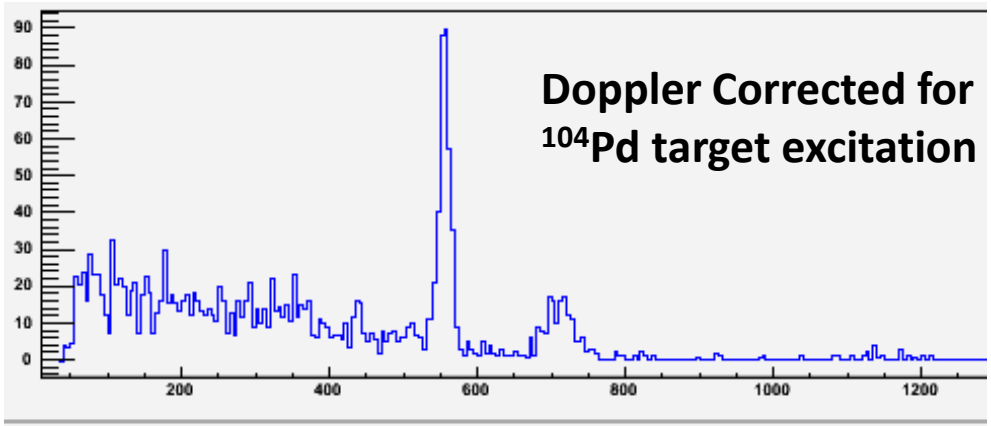
IS478: Coulomb excitation of 72Kr

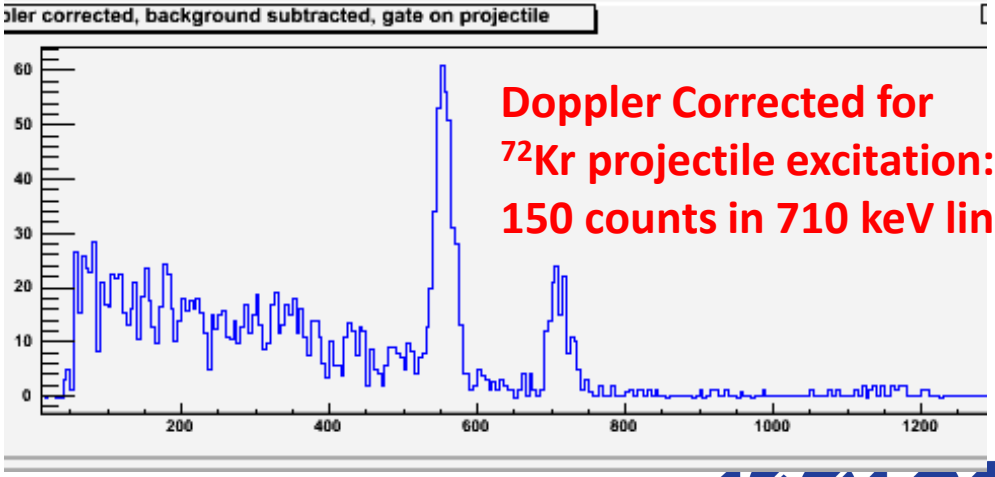
Oblate ^{72}Kr expected

Coulex Spectra - number of counts in 710 keV depends on the shape of ^{72}Kr

The technique

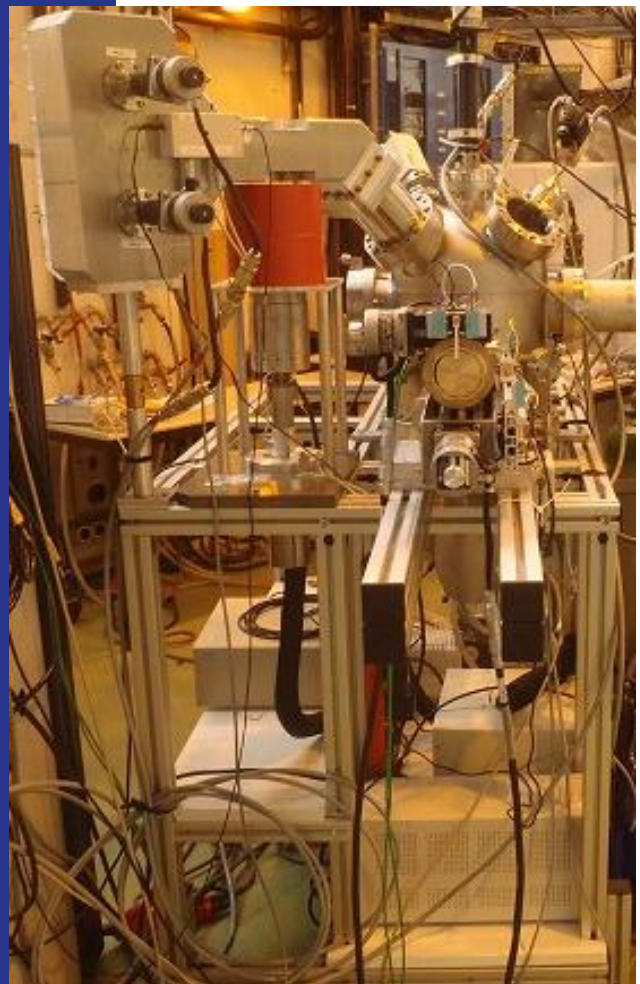


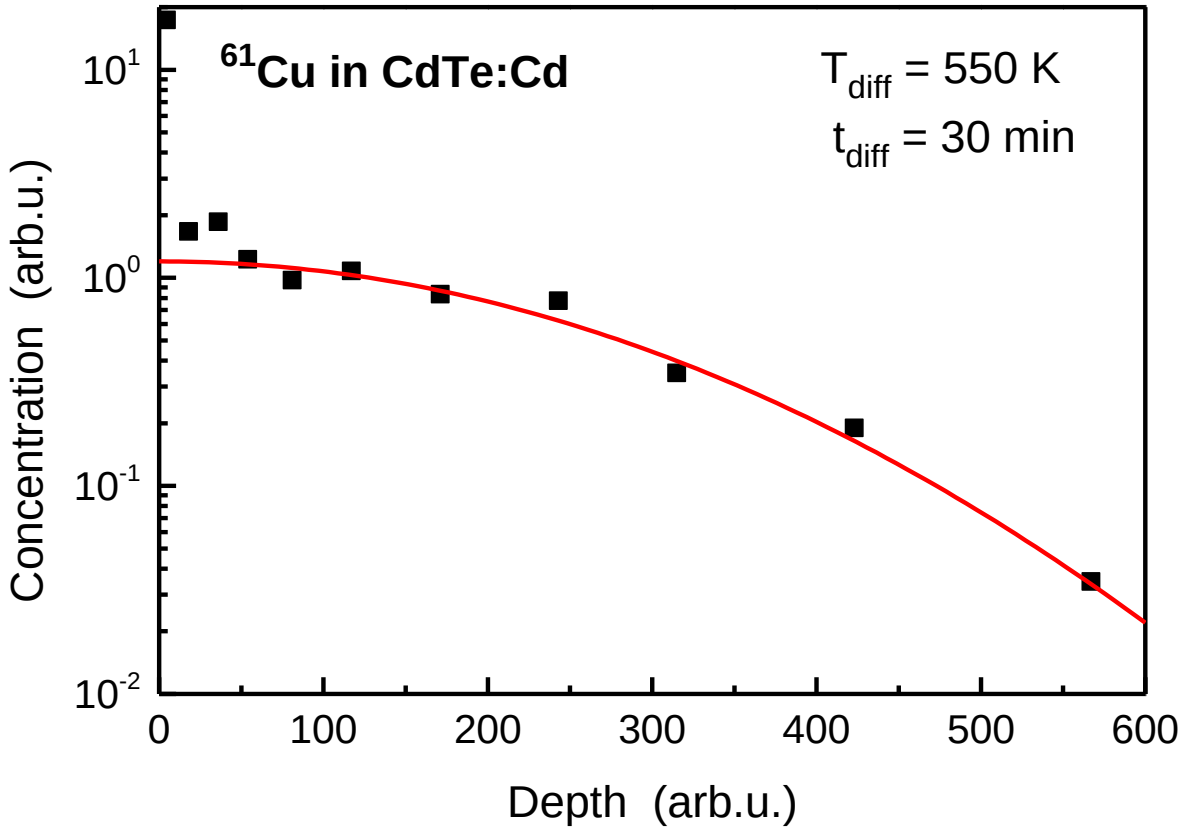




IS492: first online diffusion spectra

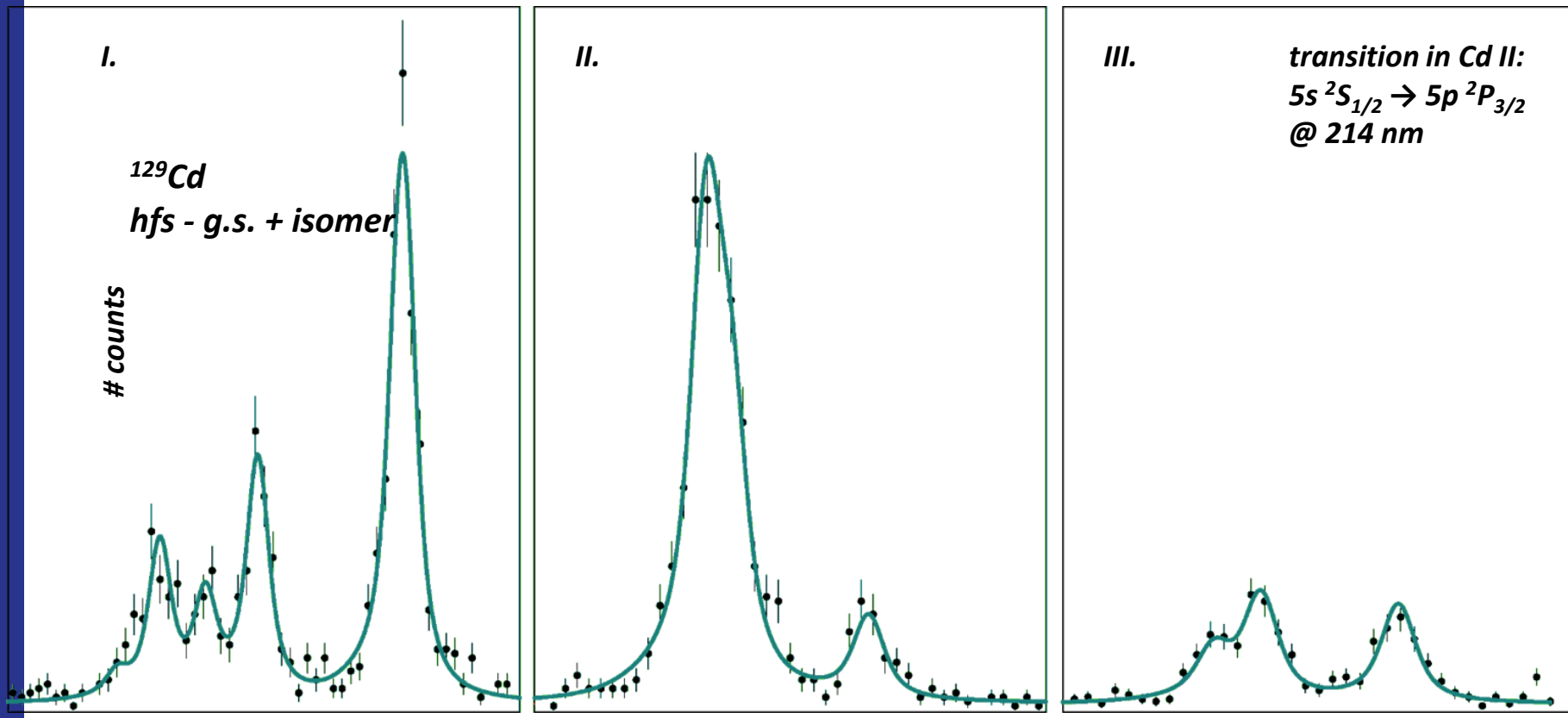
- First concentration profile measured with the new online diffusion chamber.
- The absolute depth is estimated to be in the order of about 2 µm.
- (CdTe:Cd means Cd-rich CdTe material)





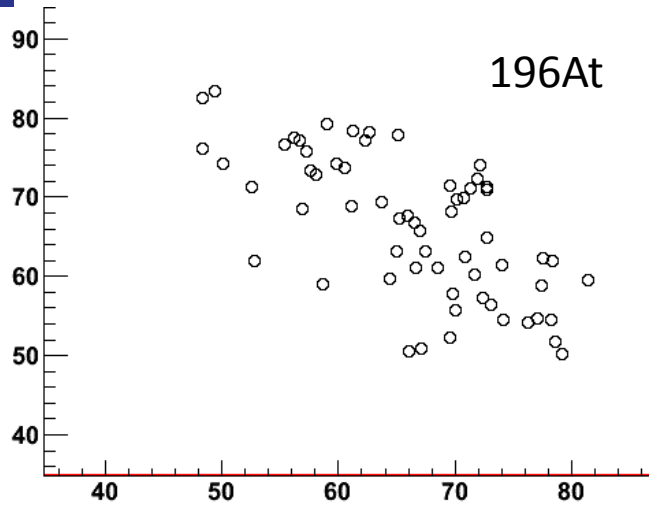
IS497: Collinear laser spectroscopy on Cd

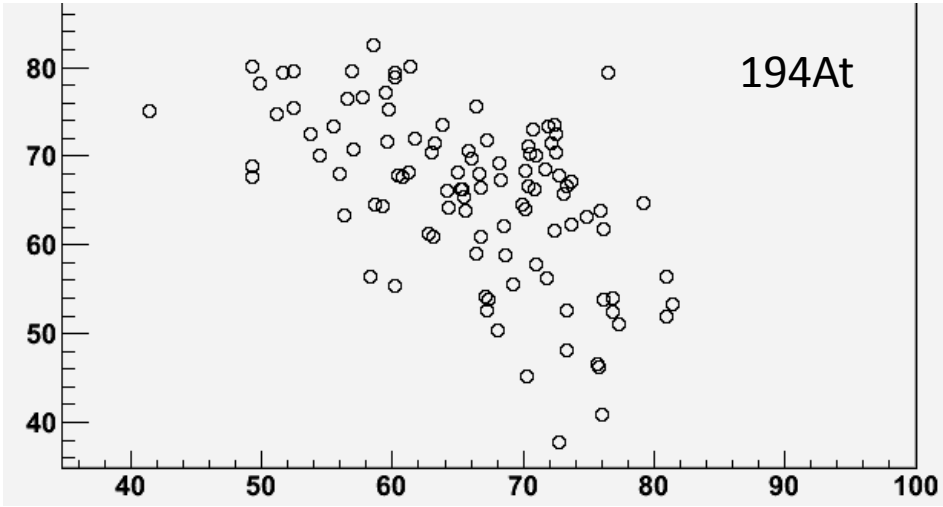
- Spins, charge radii and moments of 99-130Cd
- Discovery on new long-lived isomers in 125,127,129Cd

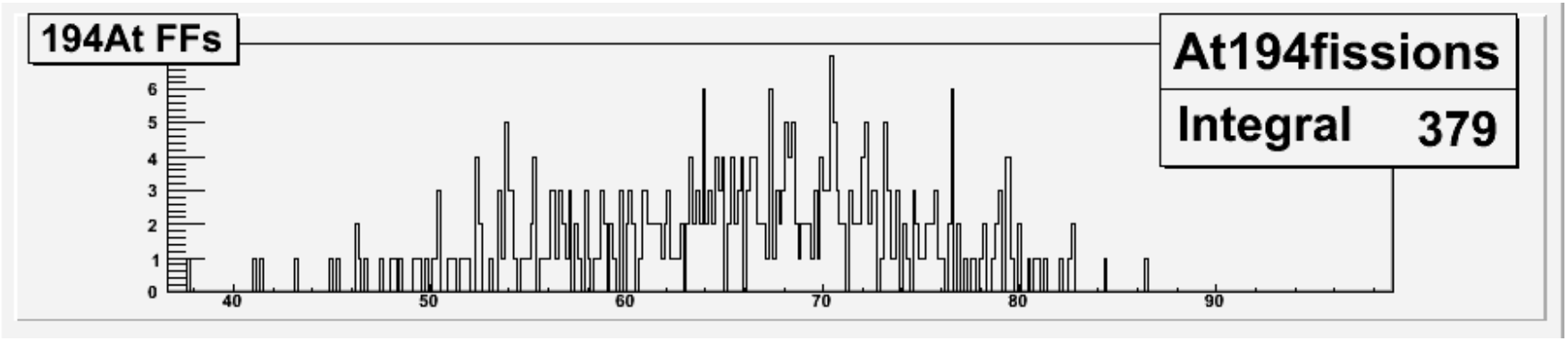


IS534: beta-delayed fission of At

- Mass Distributions Measurements of 194,196Po via β-delayed fission of 194,196At

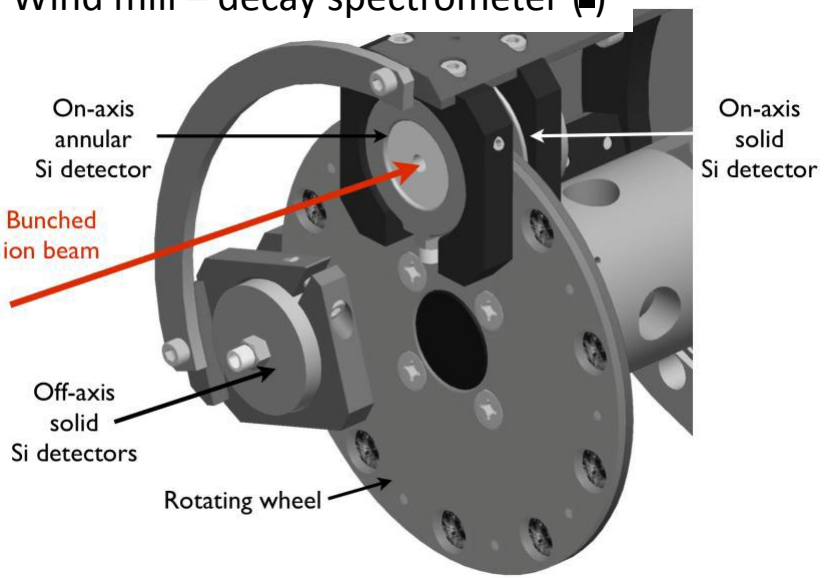


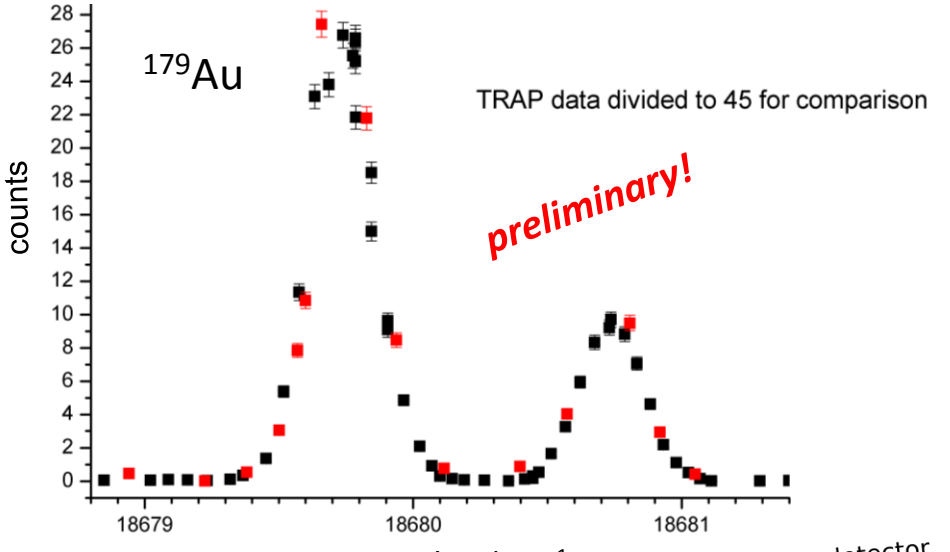


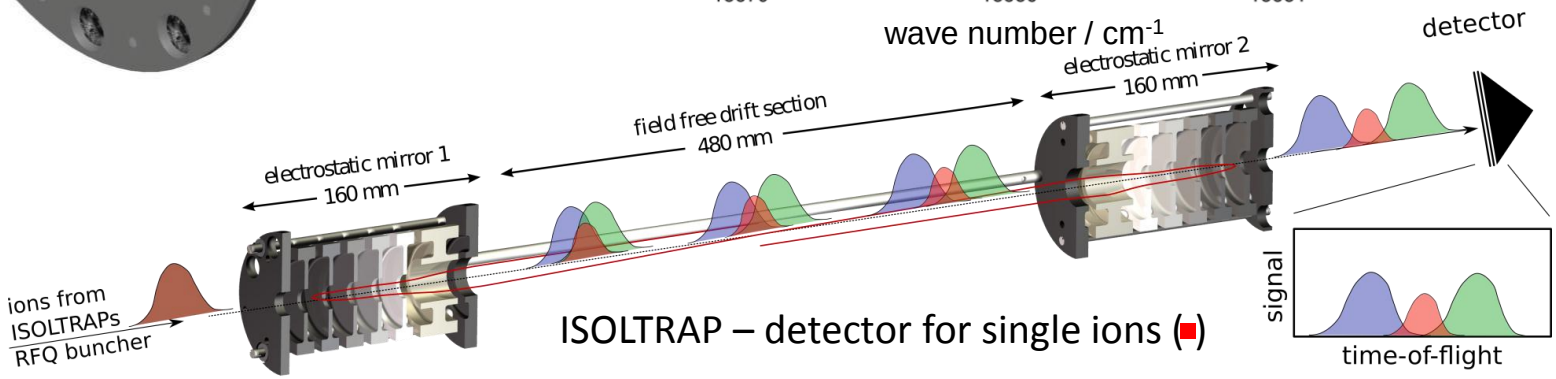


IS518& 534: Laser Spectroscopy of n-deficient Au

Wind mill – decay spectrometer (■)



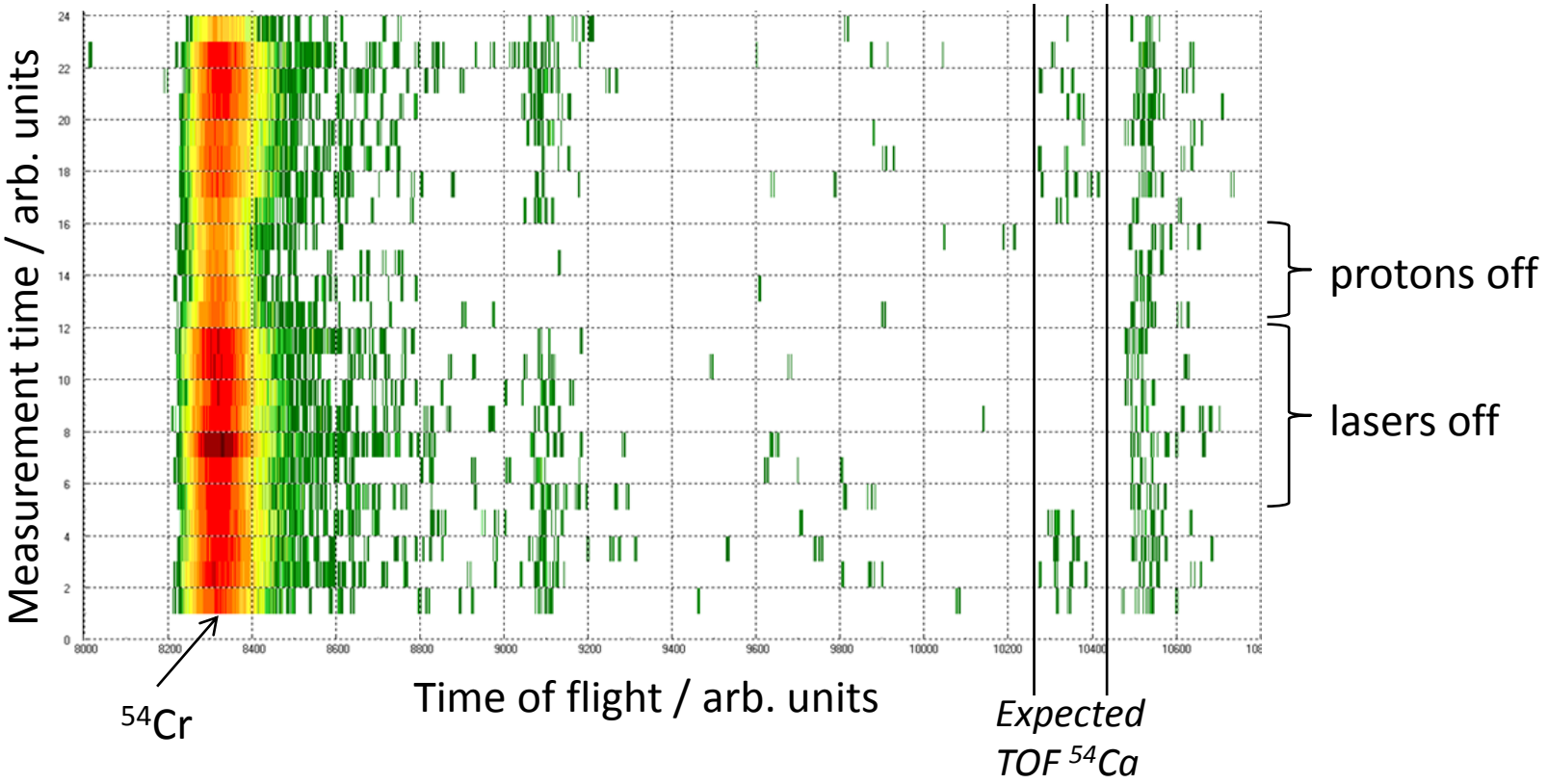




ISOLTRAP – detector for single ions (■)

- HFS studies: all isotopes are accessible due to complementarity (decay vs. counting)
  - Region of deformed nuclei in neutron-rich gold isotopes
- State-selective spectroscopy on pure samples (isomer selectivity at RILIS + isobar selectivity at ISOLTRAP)
  - Determination of excitation energies

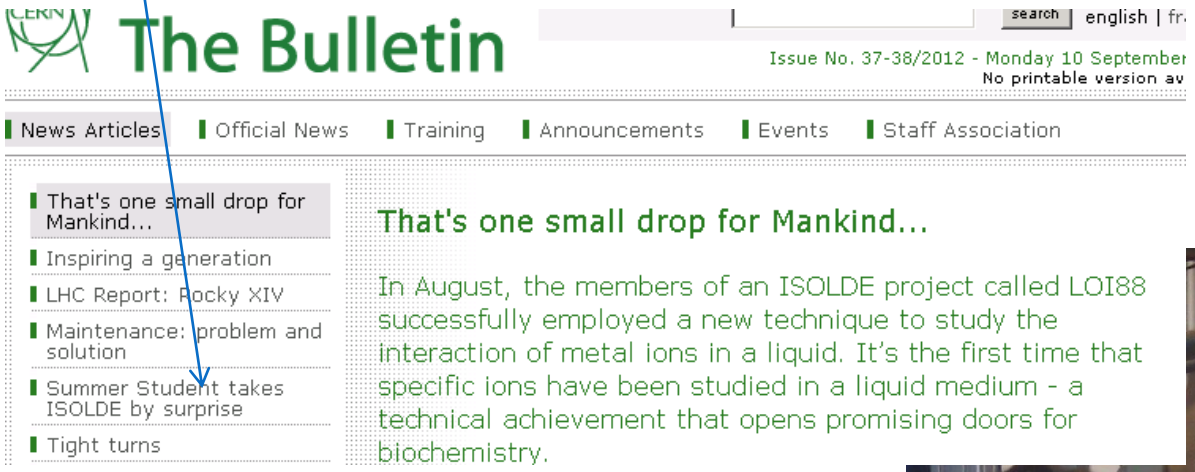
IS532: N-rich Ca masses at ISOLTRAP

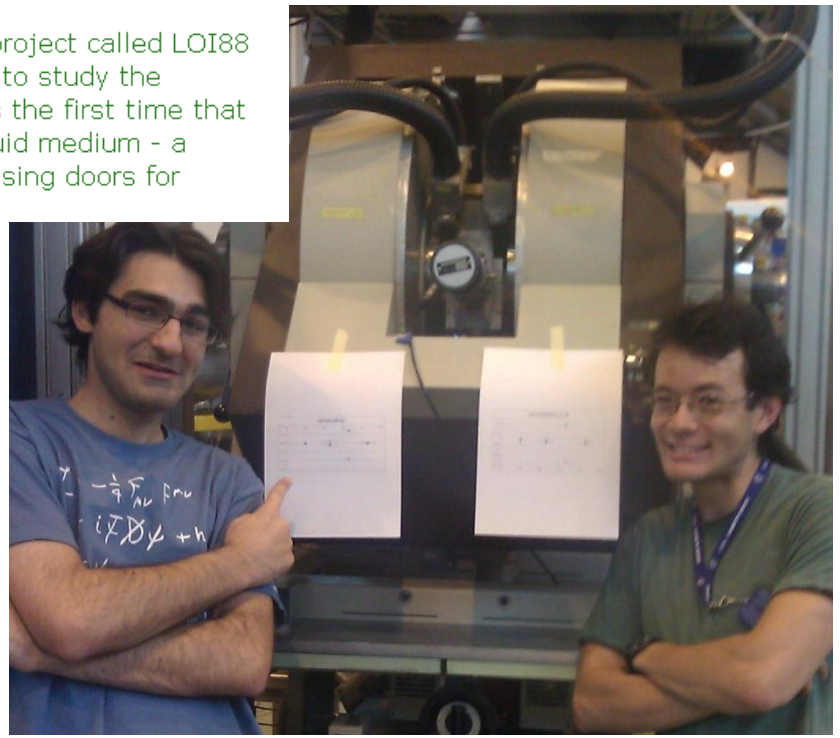


- Masses of ^{51,52}Ca measured with conventional TOF resonances in ISOLTRAP's precision trap. Agree with TITAN, uncertainty reduced by at least a factor of 10
- Direct mass-measurement using the MR-TOF on $^{52\text{-}54}$Ca
- On mass 54, 2000 ions detected in the TOF window of calcium.

New techniques (LOIs) in the summer

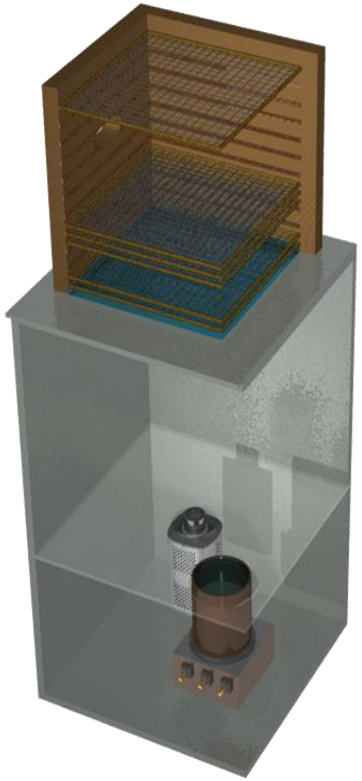
- Very successful LOI runs based on new experimental techniques:
  - Jul: spin polarization with tilted foils behind REX - % beta-NMR signal on 8Li
  - Aug: beta-NMR on liquids for biophysics – 1st liquid beta-NMR signal (31Mg in ionic liquid)
  - Aug & Oct – CRIS shows expected detection efficiency and reaches 202Fr

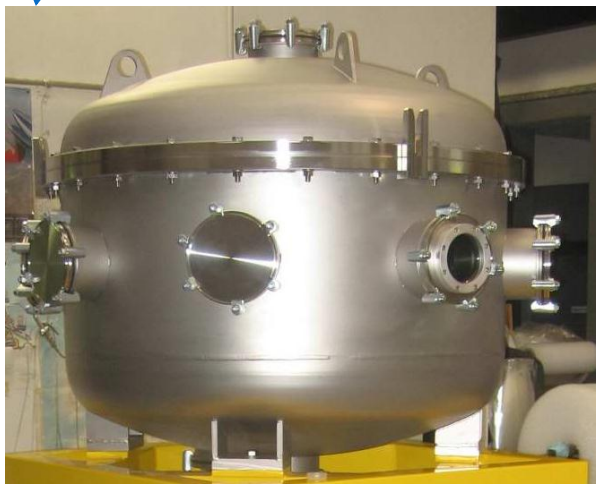


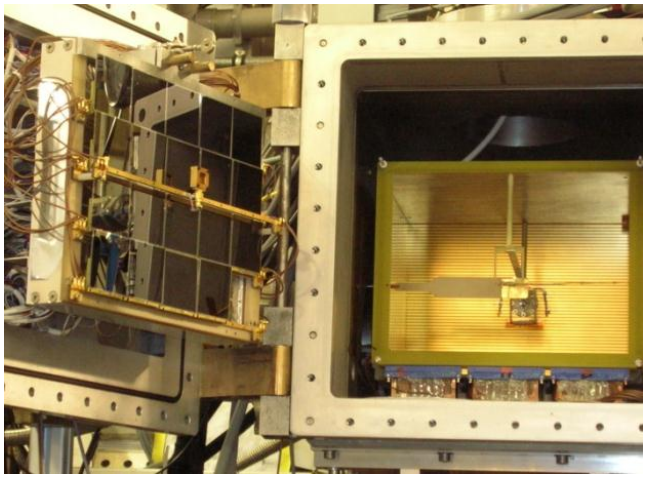


New setups in the summer

- Successful experiments with new setups & by new groups:
  - 21Na and 31Mg with REX scattering chamber (Lund and Tokyo);
  - 6He with opt. time-proj. chamber (Warsaw);
  - 34Mg with fast tape-station (Bucharest)
  - 12 Be with active target MAYA;







Long shutdown

- Presently: first protons to ISOLDE at the end of June 2014
- Access to ISOLDE: with permanent dosimeter, helmets and safety shoes; under discussion whether safety equipment will stay after LS1