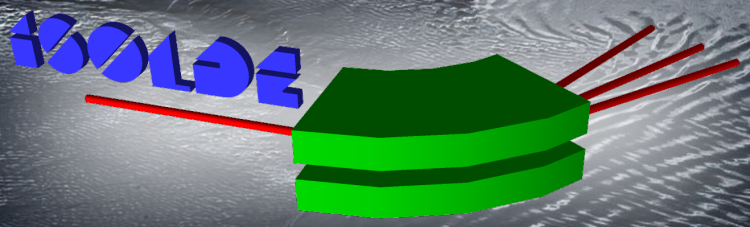
RFQ beam-cooler
New tapestation

Status report to ISCC

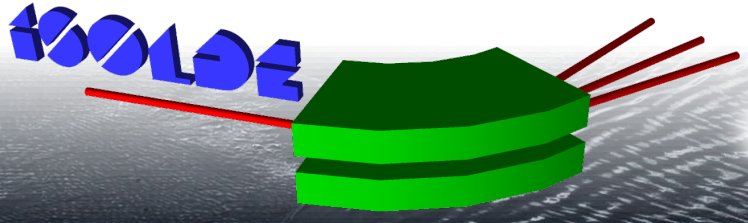
Tim Giles - Feb 2016



RFQ

Transmission

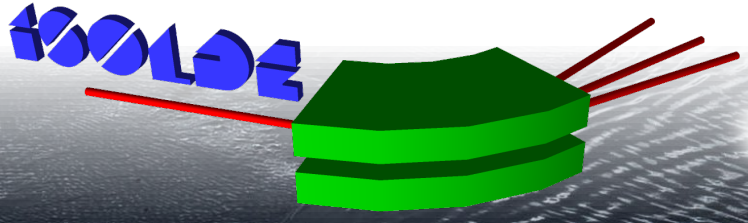
Operation at 60kV



RFQ

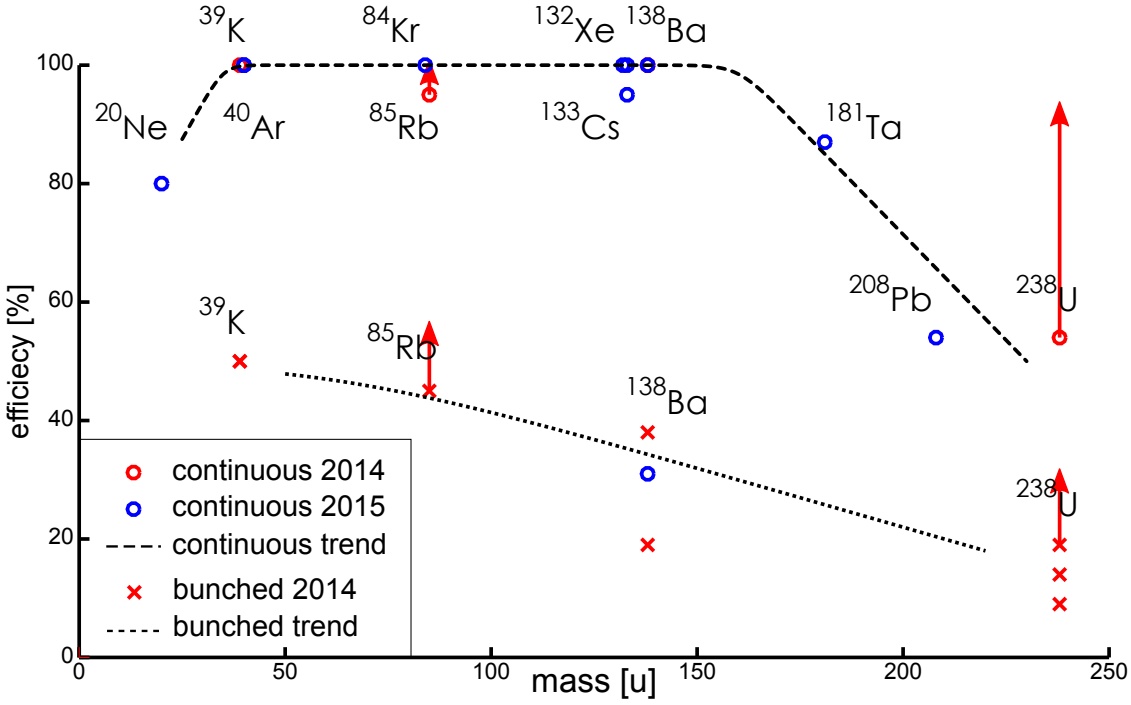
Transmission in "normal operation" is 60-80%

(including HRS, continuous beam at 30kV)



RFQ

transmission



RF power amplifier was "broken"!!!

FC690 > FC748 = 100%, implies losses at injection

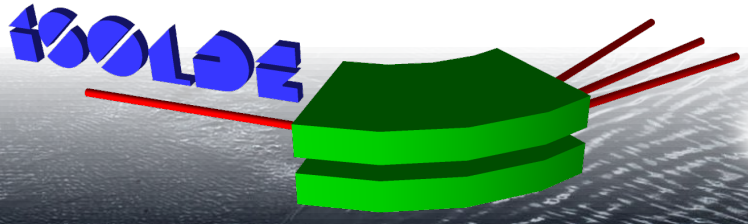
RFQ

Reduce injection losses :

Reduce beam emittance - Operate beam at 60kV

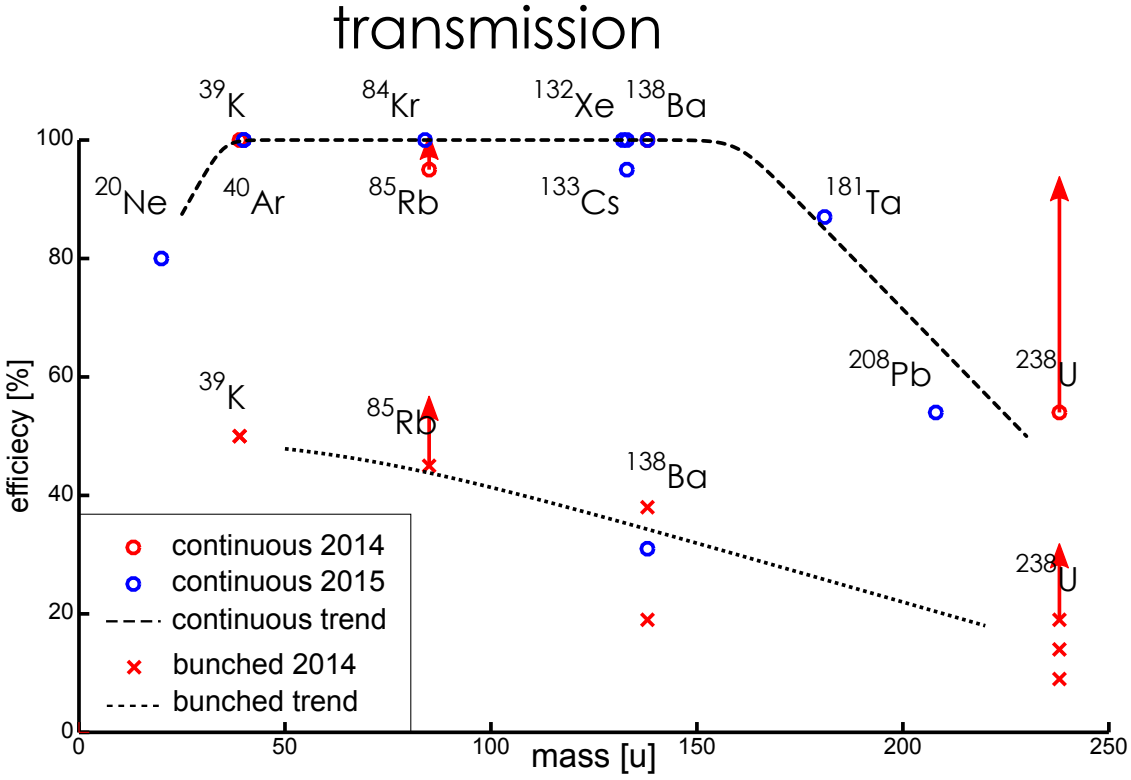
Recalculate HRS tune - Balance resolving power with injection acceptance

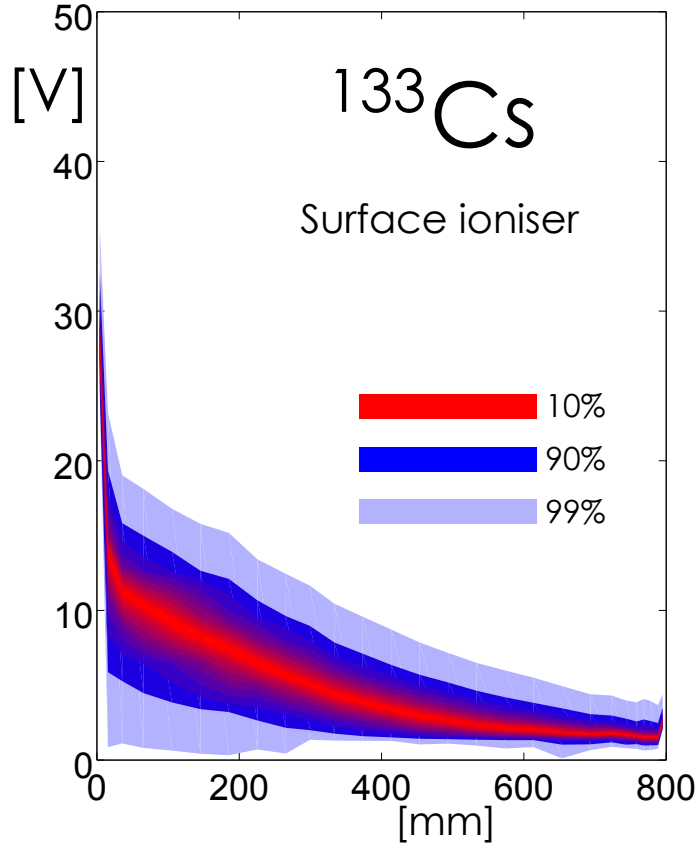
Upgrade RF power and improve readout

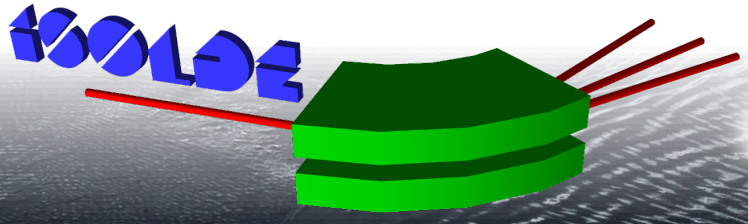


RFQ

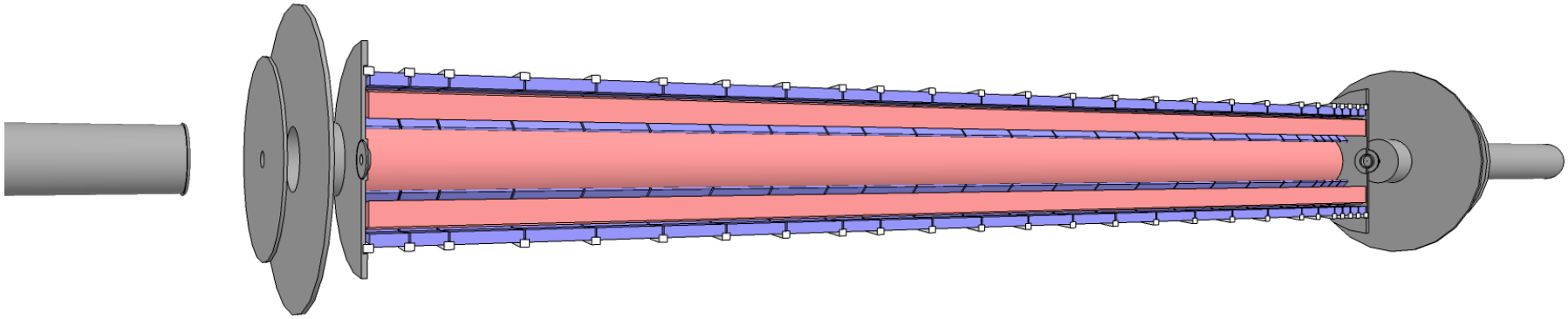
Origin of losses in bunching mode?

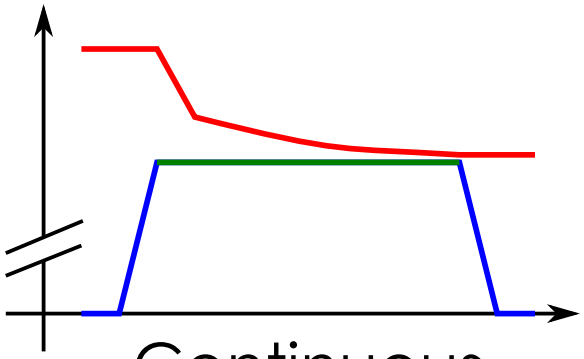




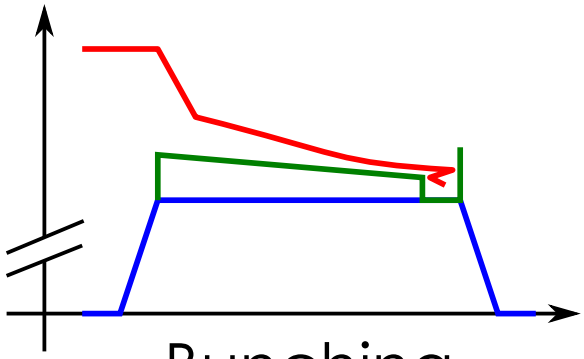


RFQ

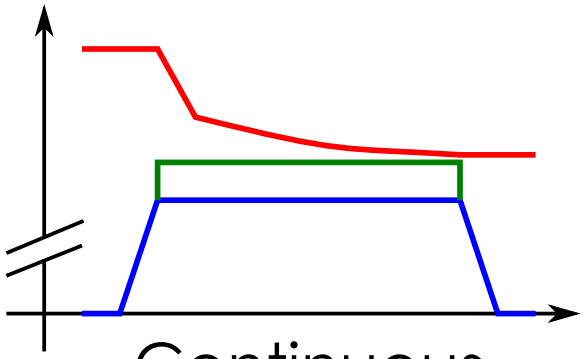




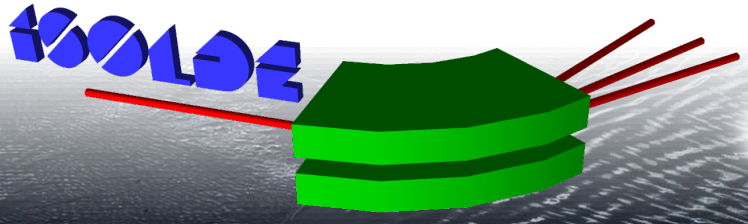
Continuous
(standard)



Bunching
(standard)



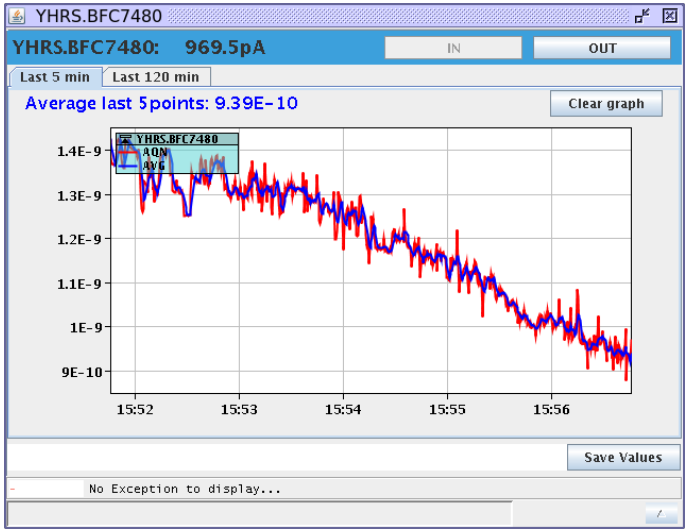
Continuous
(experimental)

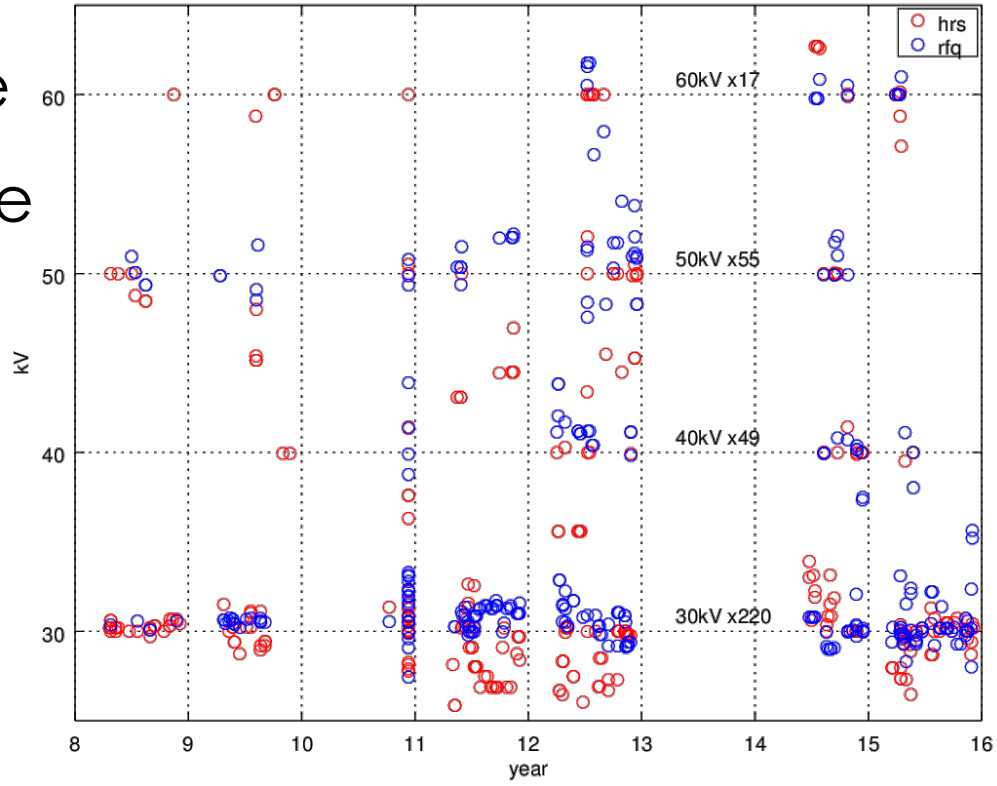


RFQ

Operation at 60kV:
Reduces beam emittance

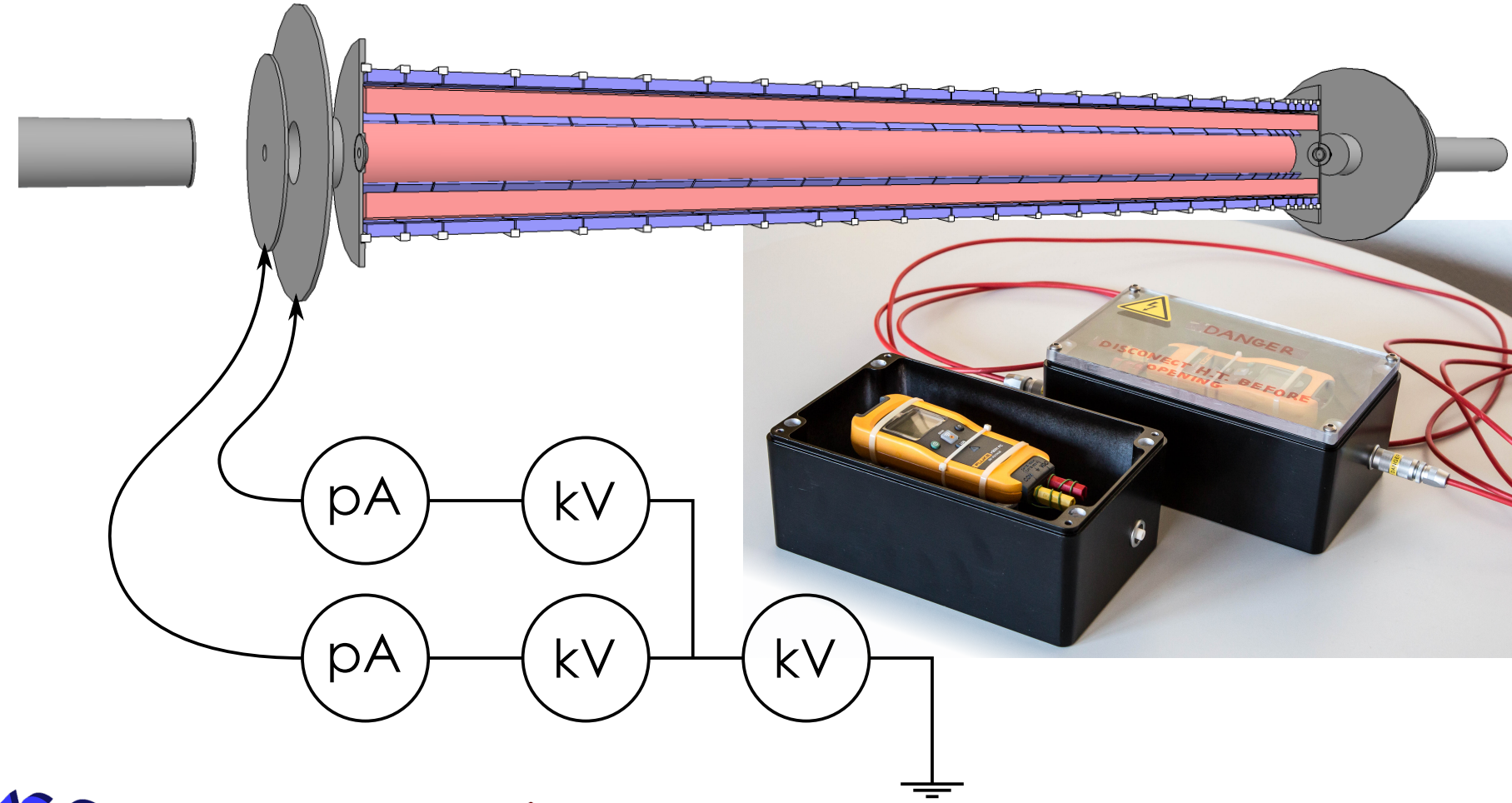
Improves HRS performance
Improves RFQ injection
Improves transport
Improves expt injection





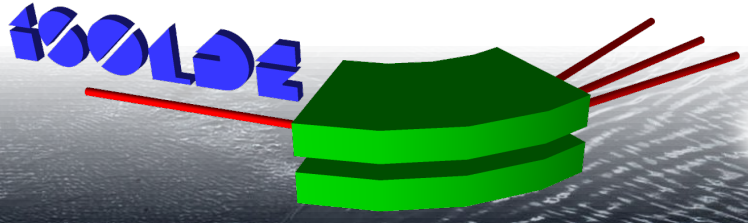
RFQ

Investigation of 60kV instability



RFQ

Transport efficiency :	New HRS tune Investigation of bunching tune Higher beam energy Better RF power supply
Operation at 60kV :	Continue investigation
New techniques :	Laser-induced molecular breakup

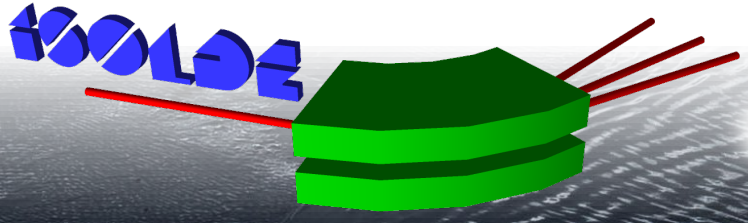


TapeStation

Construction status

Installation planning

Exploitation & software



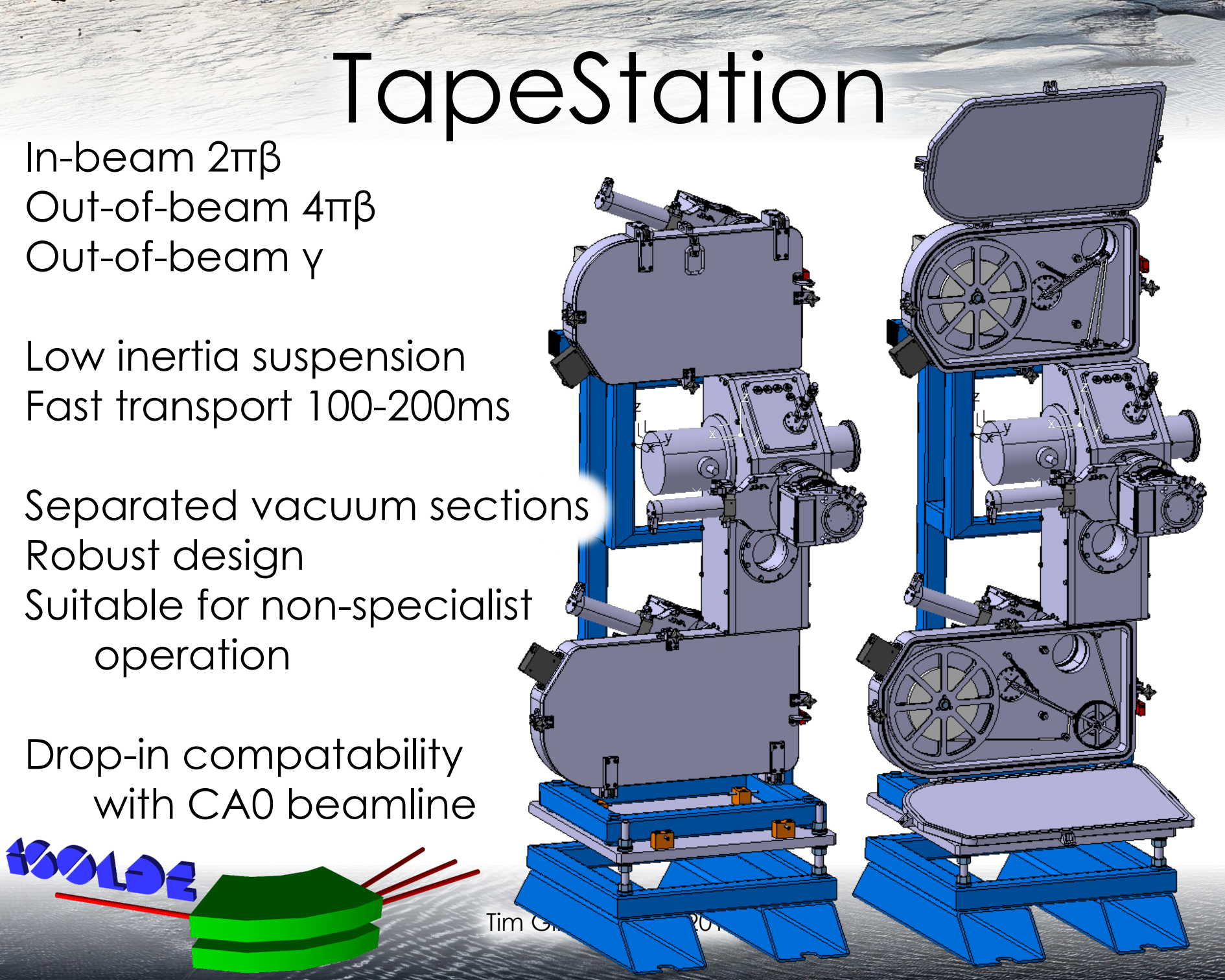
TapeStation

In-beam 2πβ
Out-of-beam 4πβ
Out-of-beam γ

Low inertia suspension
Fast transport 100-200ms

Separated vacuum sections
Robust design
Suitable for non-specialist operation

Drop-in compatability with CA0 beamline

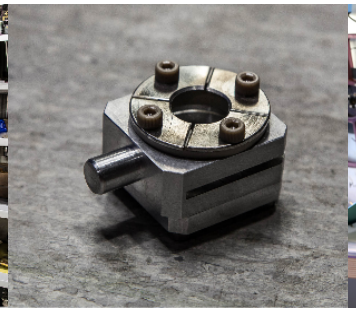
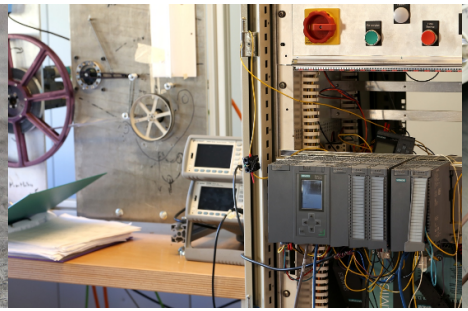
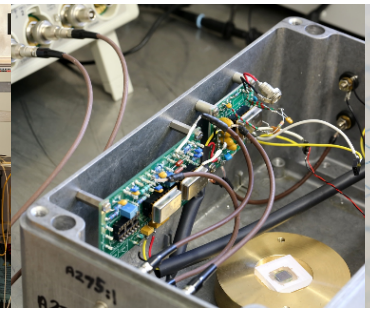
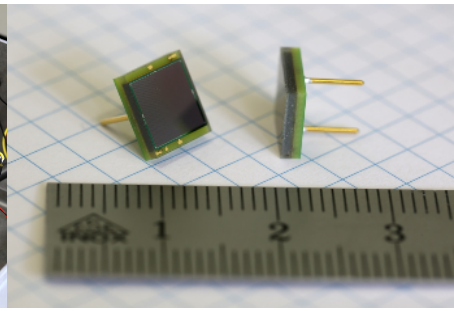


TapeStation

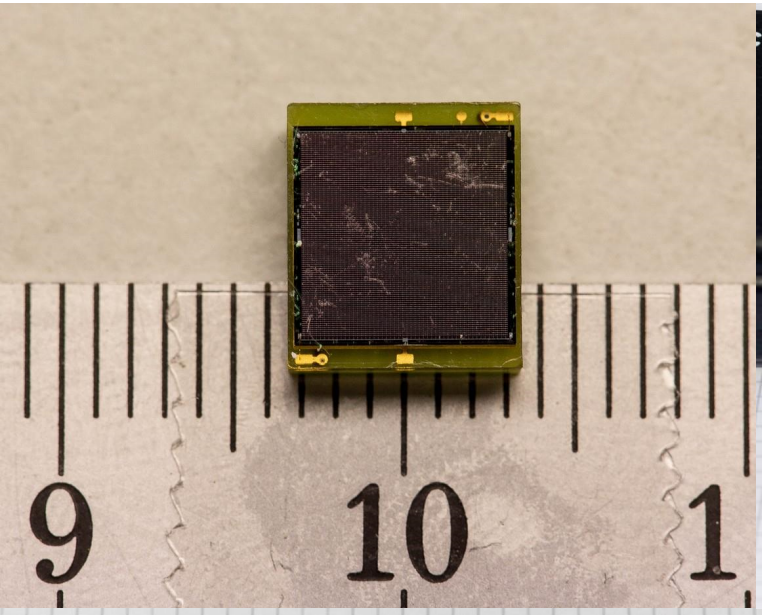
Mechanics : Support chassis complete
Most pieces arrived
Main vacuum chamber delayed

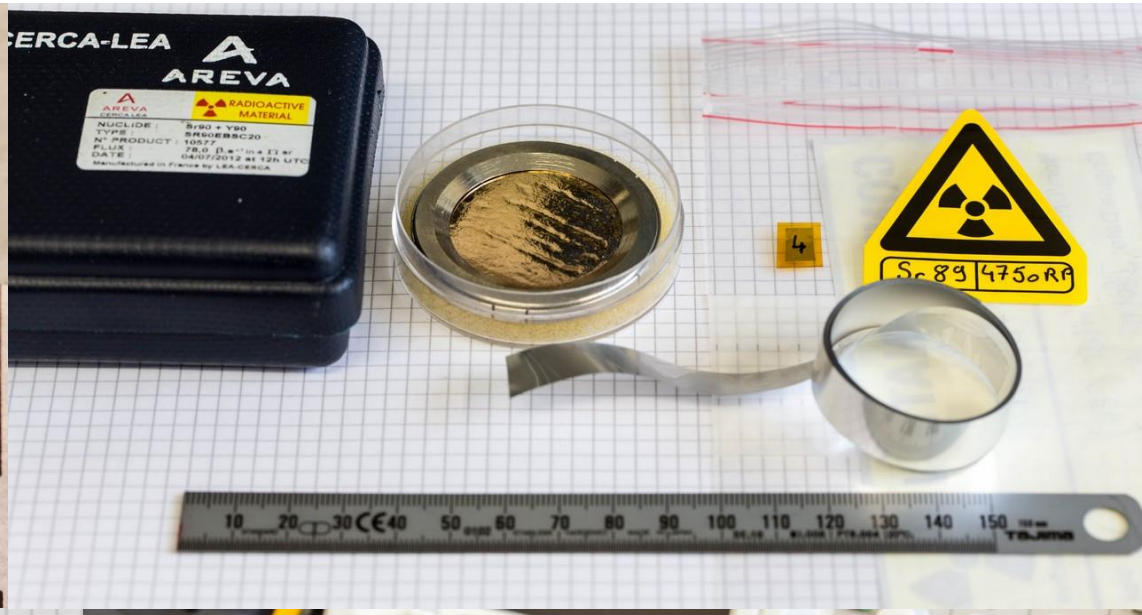
Controls : Ready
Waiting for completion of mechanics

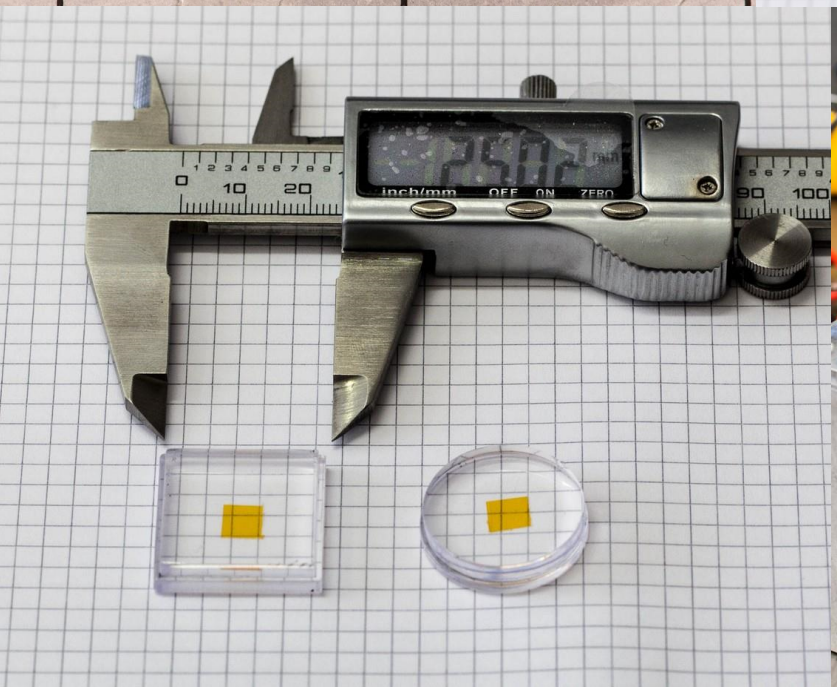
Detectors : Design complete
Construction started

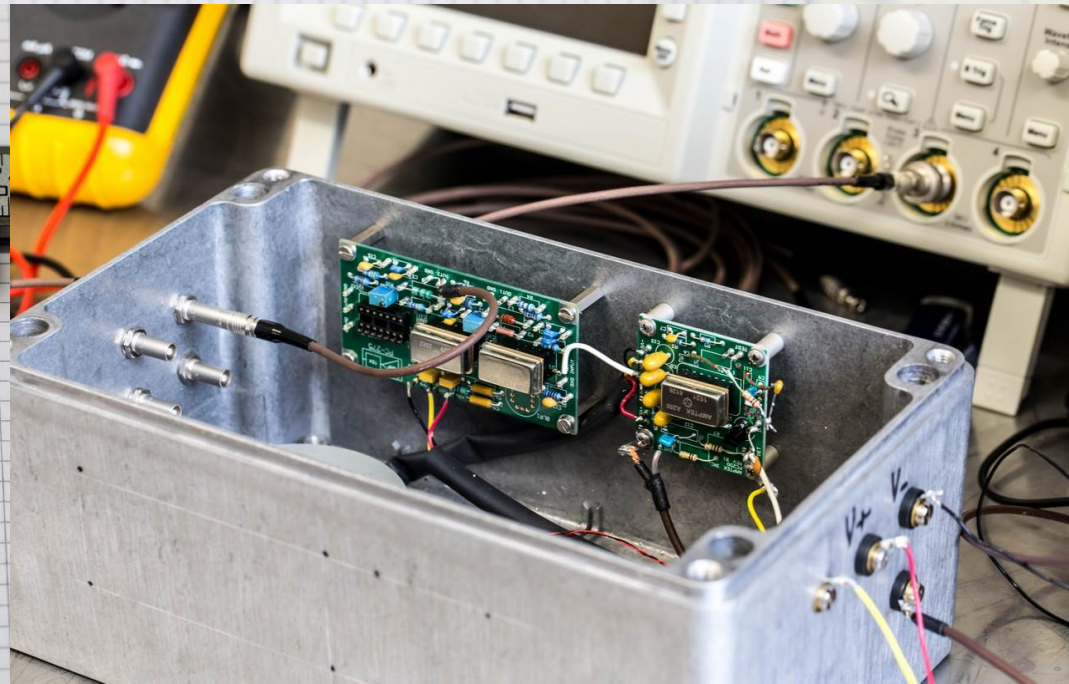






TapeStation

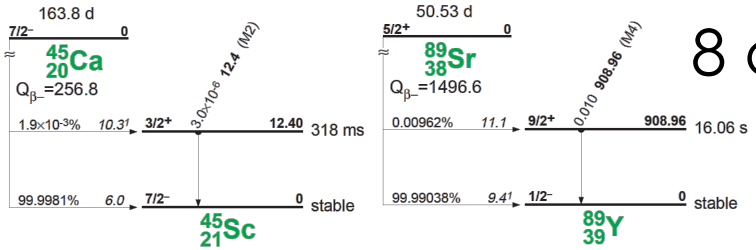






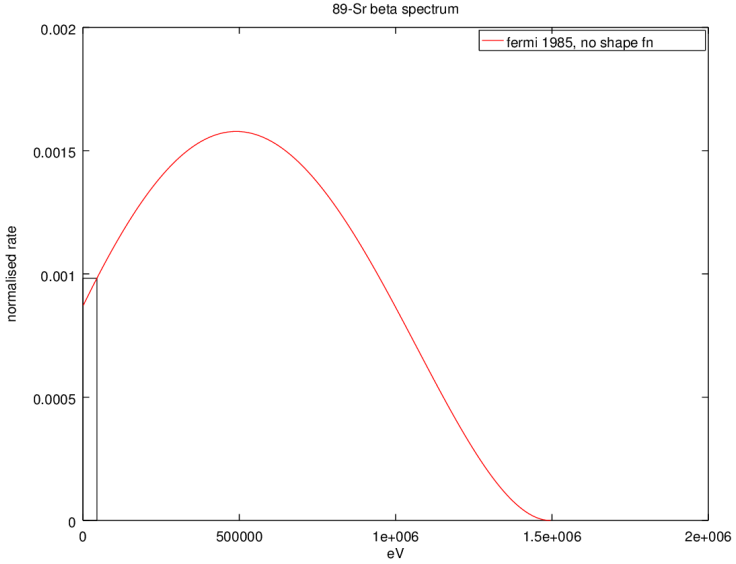


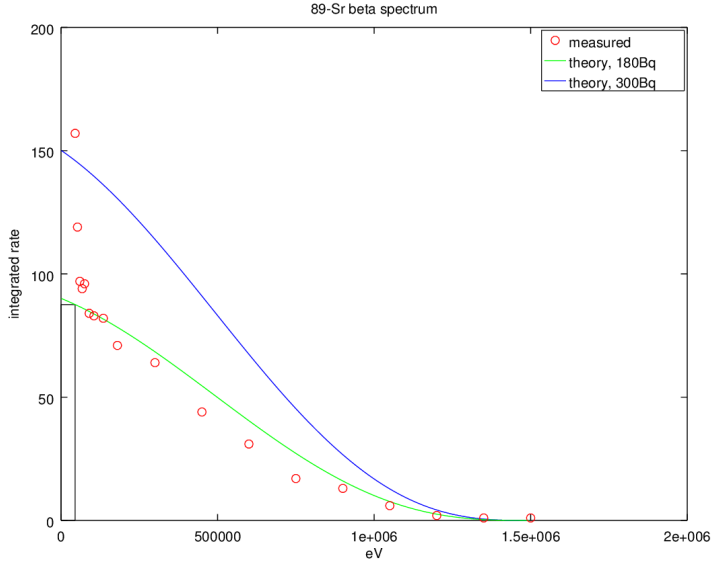
TapeStation



8 calibration sources made at Isolde

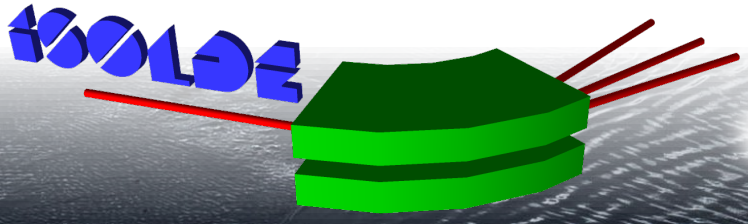
89-Sr results:





Threshold = 45 keV

Efficiency = 97% (Qbeta = 1.5MeV)



TapeStation

Assembly ongoing

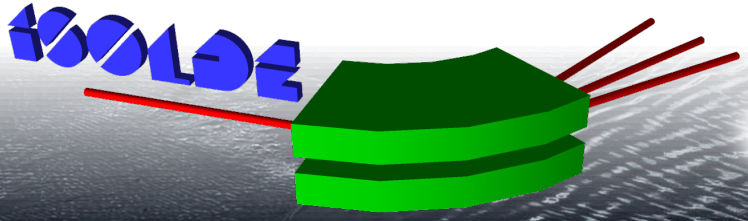
Endurance tests completed by March

Installation at Isolde in March

Commissioning with calibration sources

Commissioning with beam and comparison with old tapestation during 2016

Removal of old tapestation and installation in CA0 during 2016/17 shutdown



TapeStation

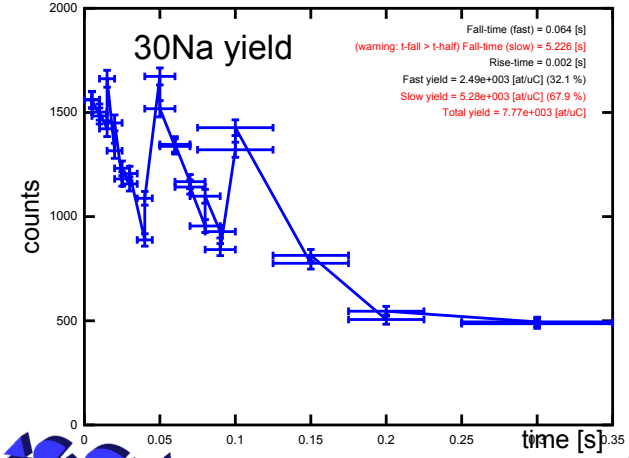
Merge data-taking with automatic yield analysis

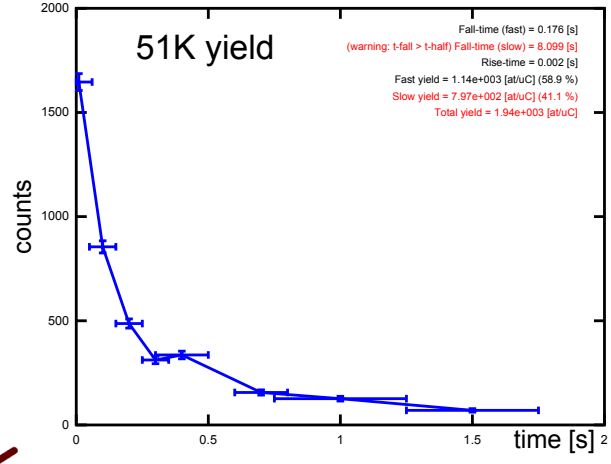
Automate release curve measurement

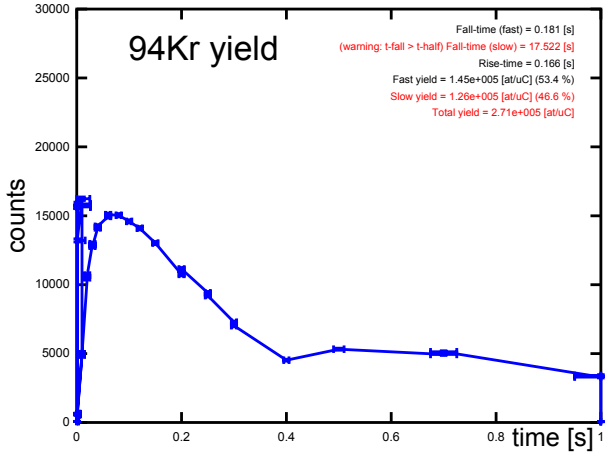
Automatic proton-target scans

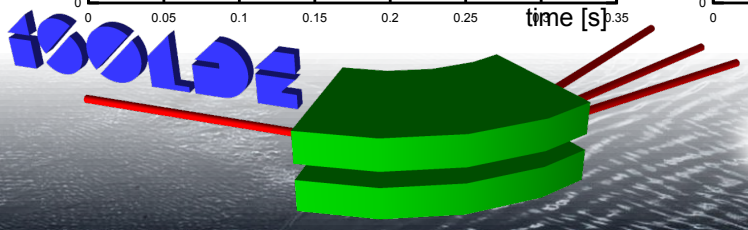
Decay curves

Integrated yields over target lifetime









Tim Giles - Feb 2016