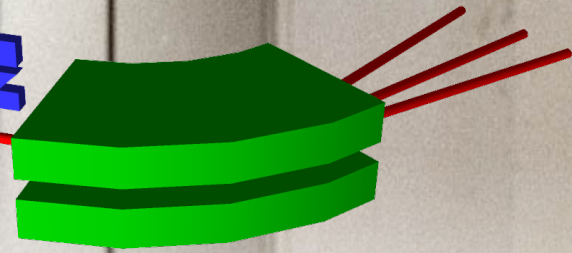




ISOLDE



The New Fast Tape Station for ISOLDE

Tim Giles --- Dec 2015

Isolde F-T-S

Proton Beam Setup

Radioactive Yield Measurement

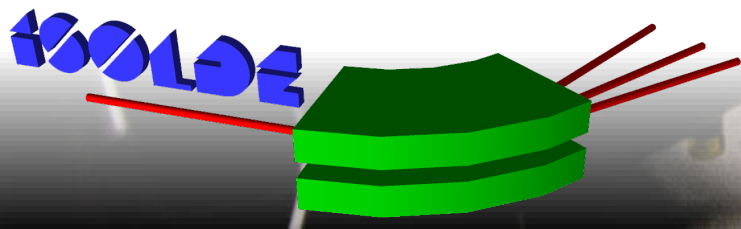
Target Lifetime

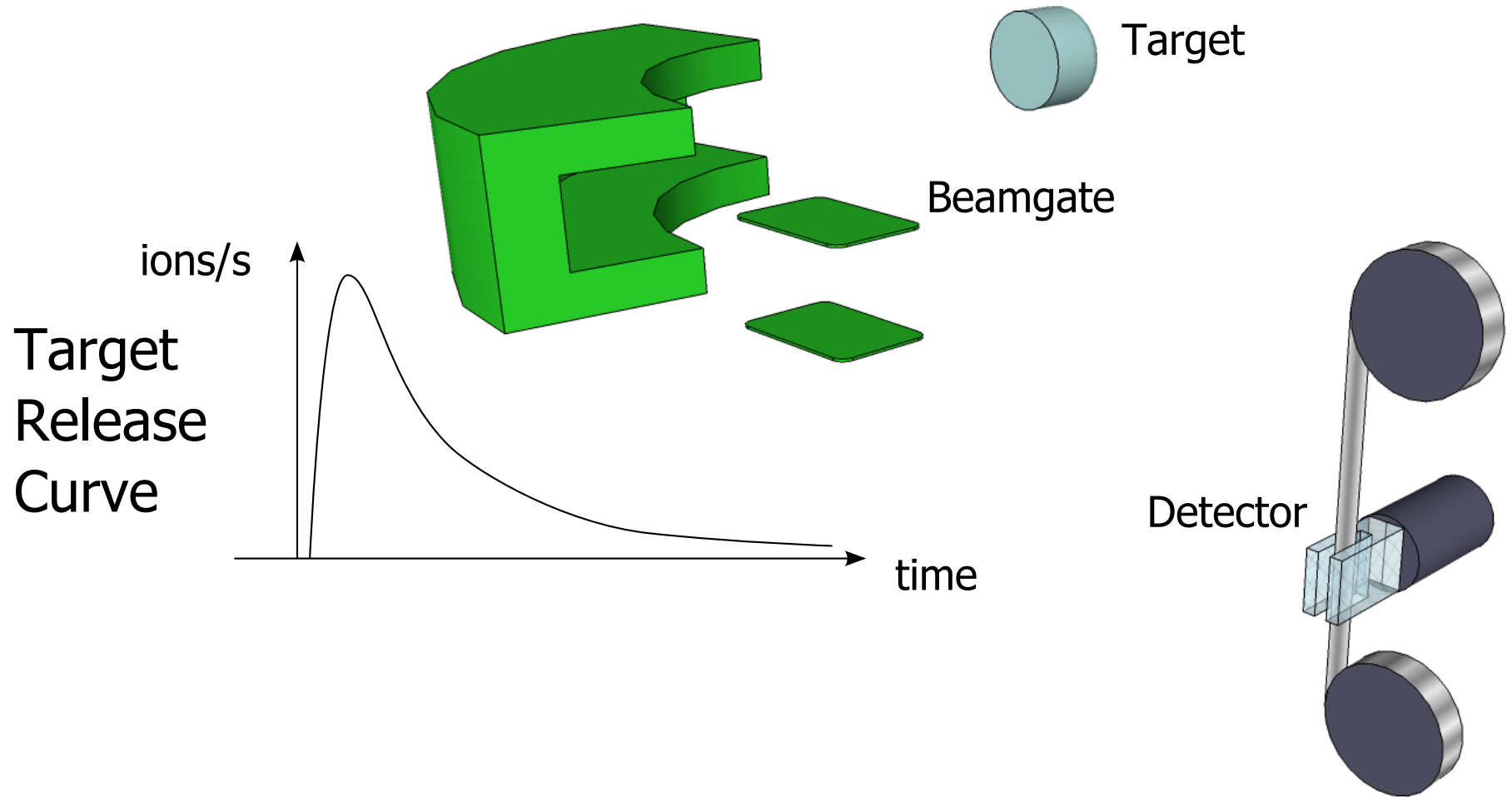
Beam Quality

Beam Development

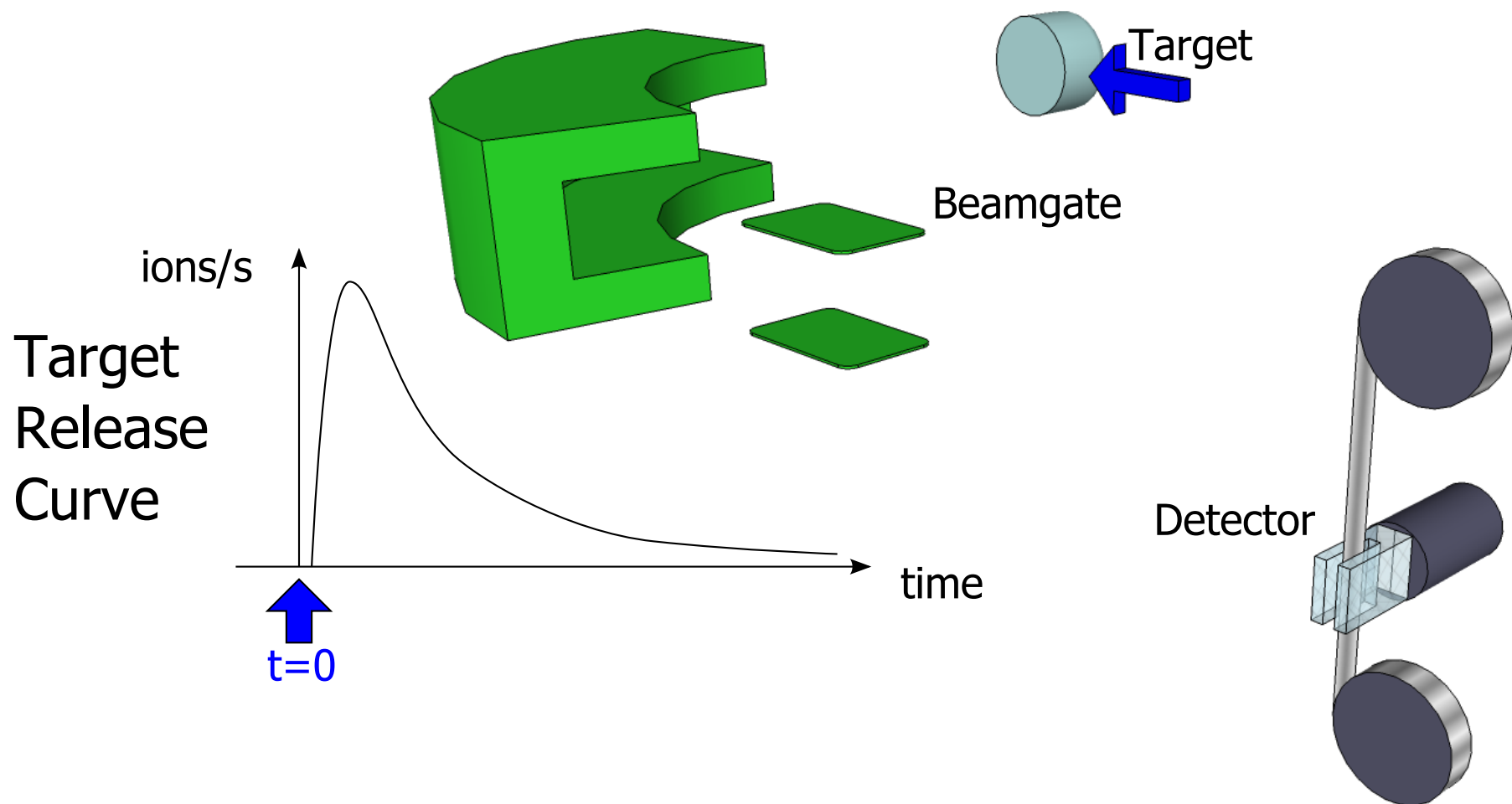
Diagnostic

Beam composition

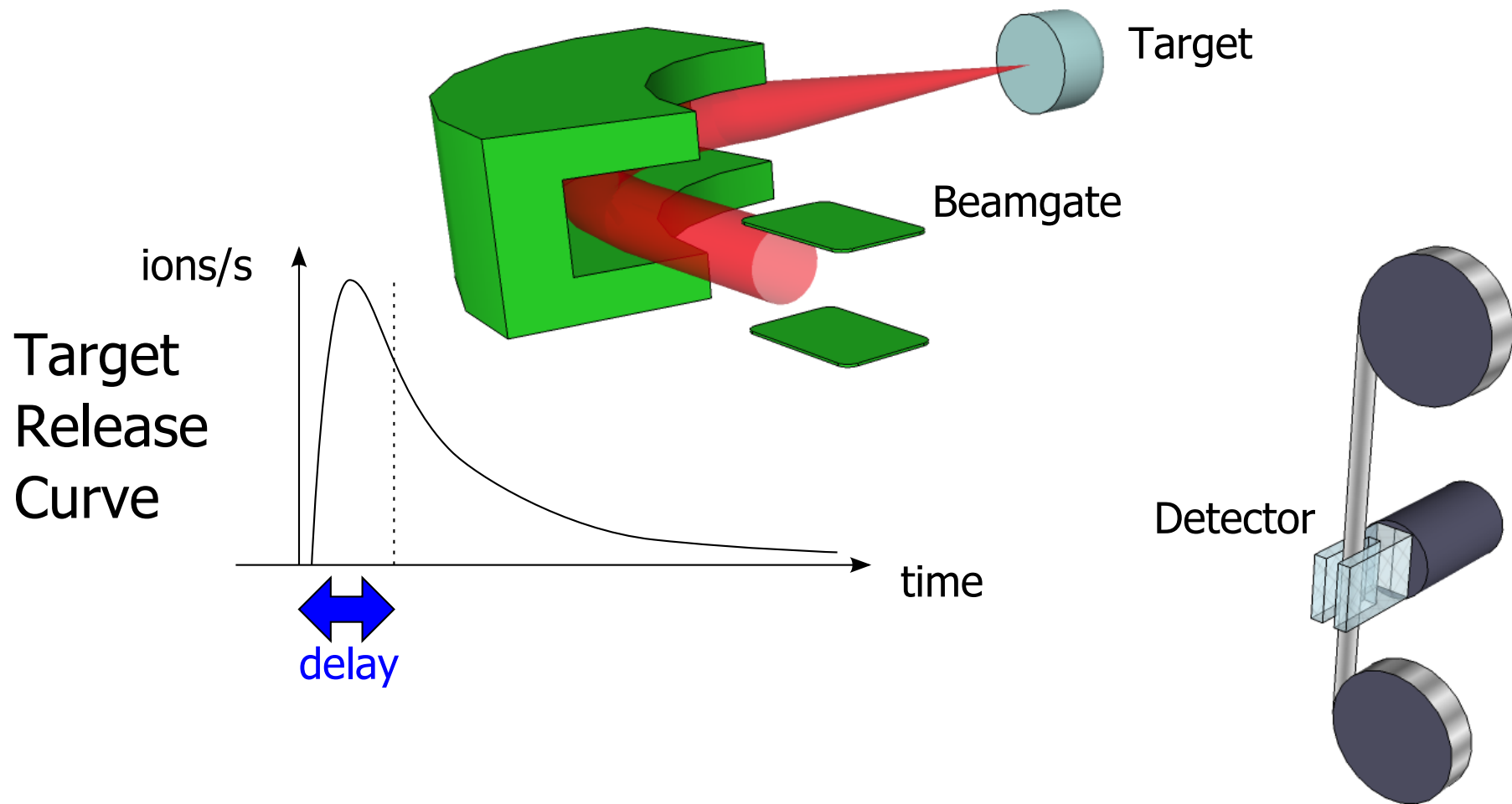




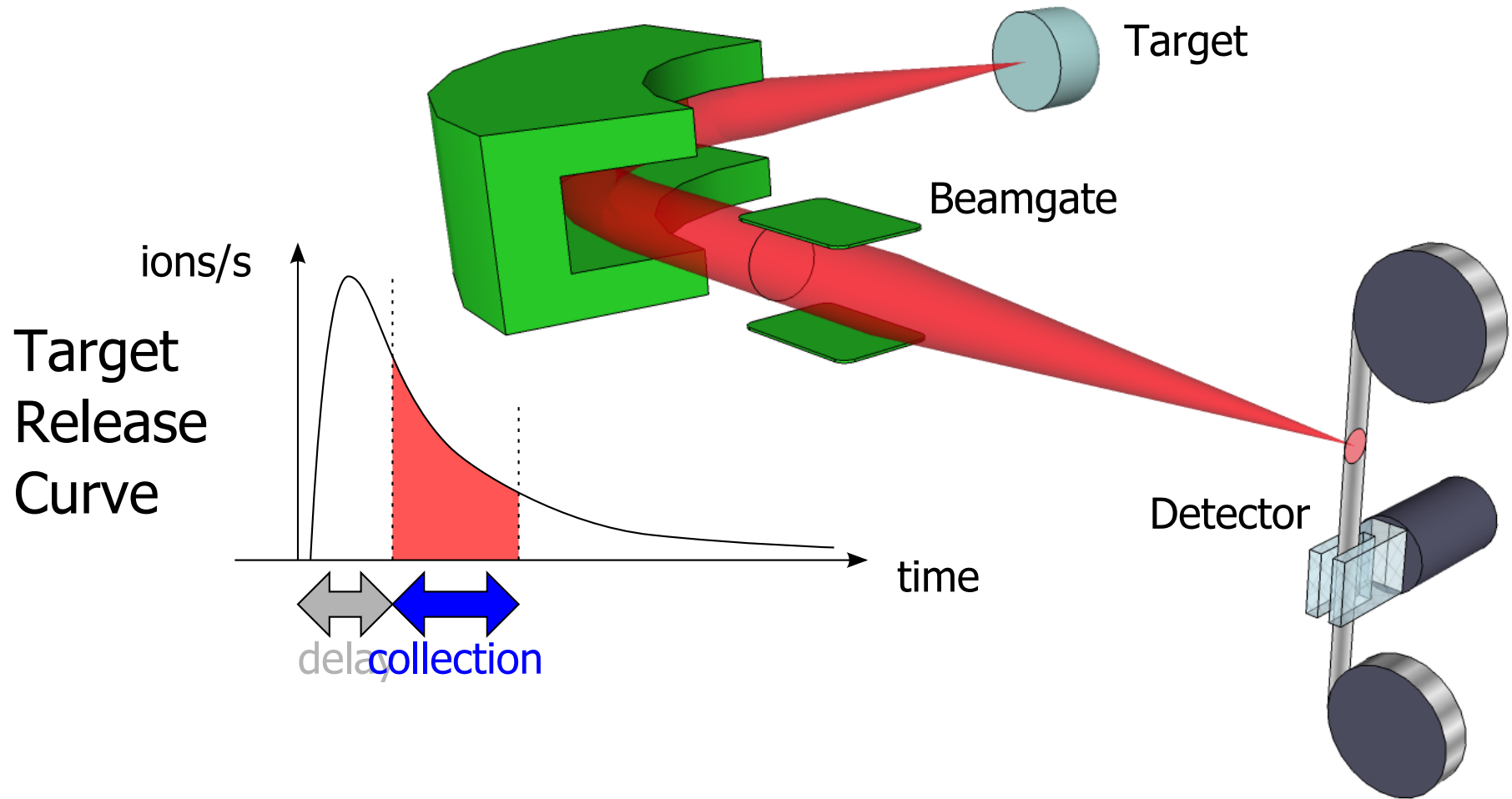
Measurement Cycle: Proton impact



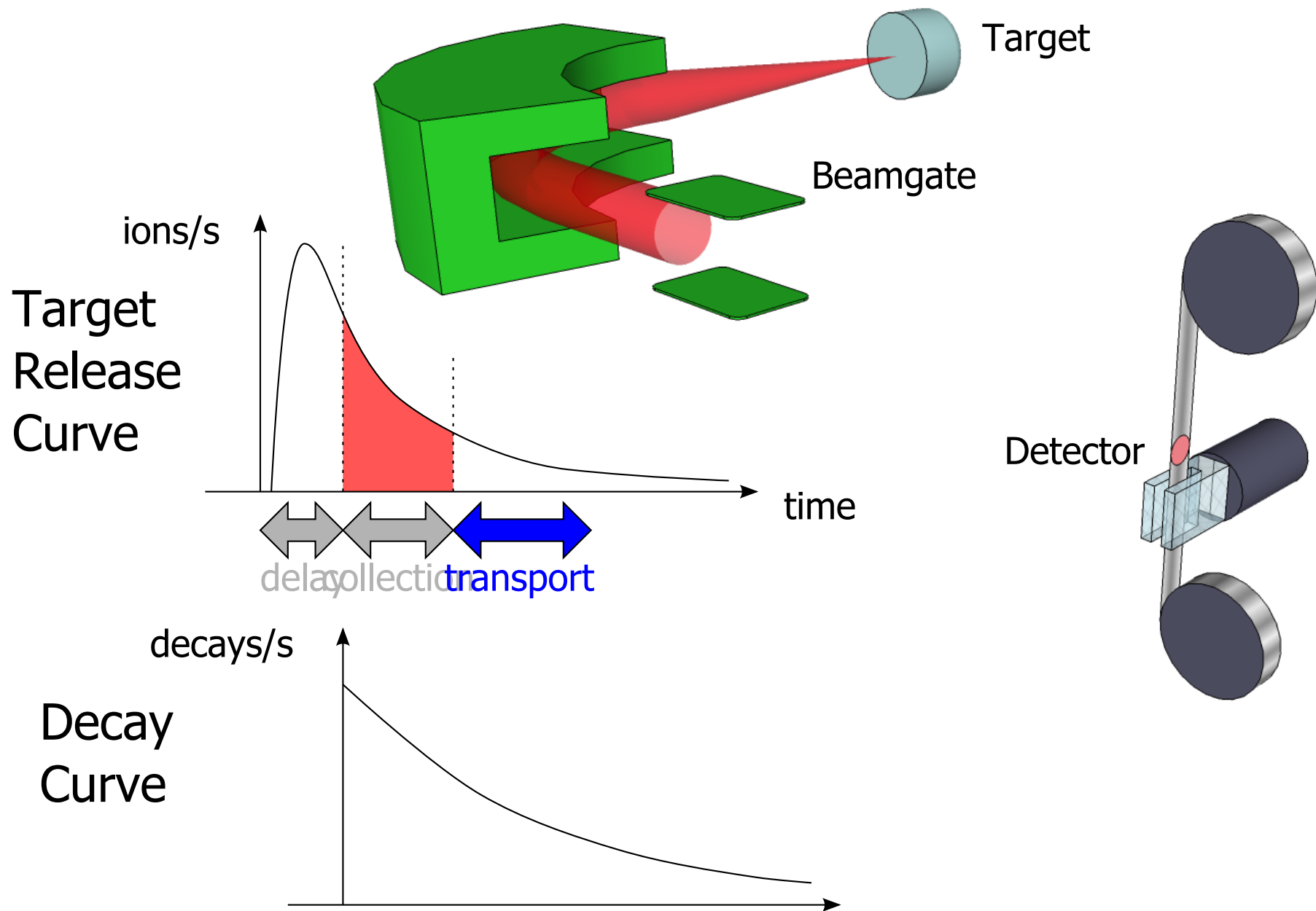
Measurement Cycle: Delay



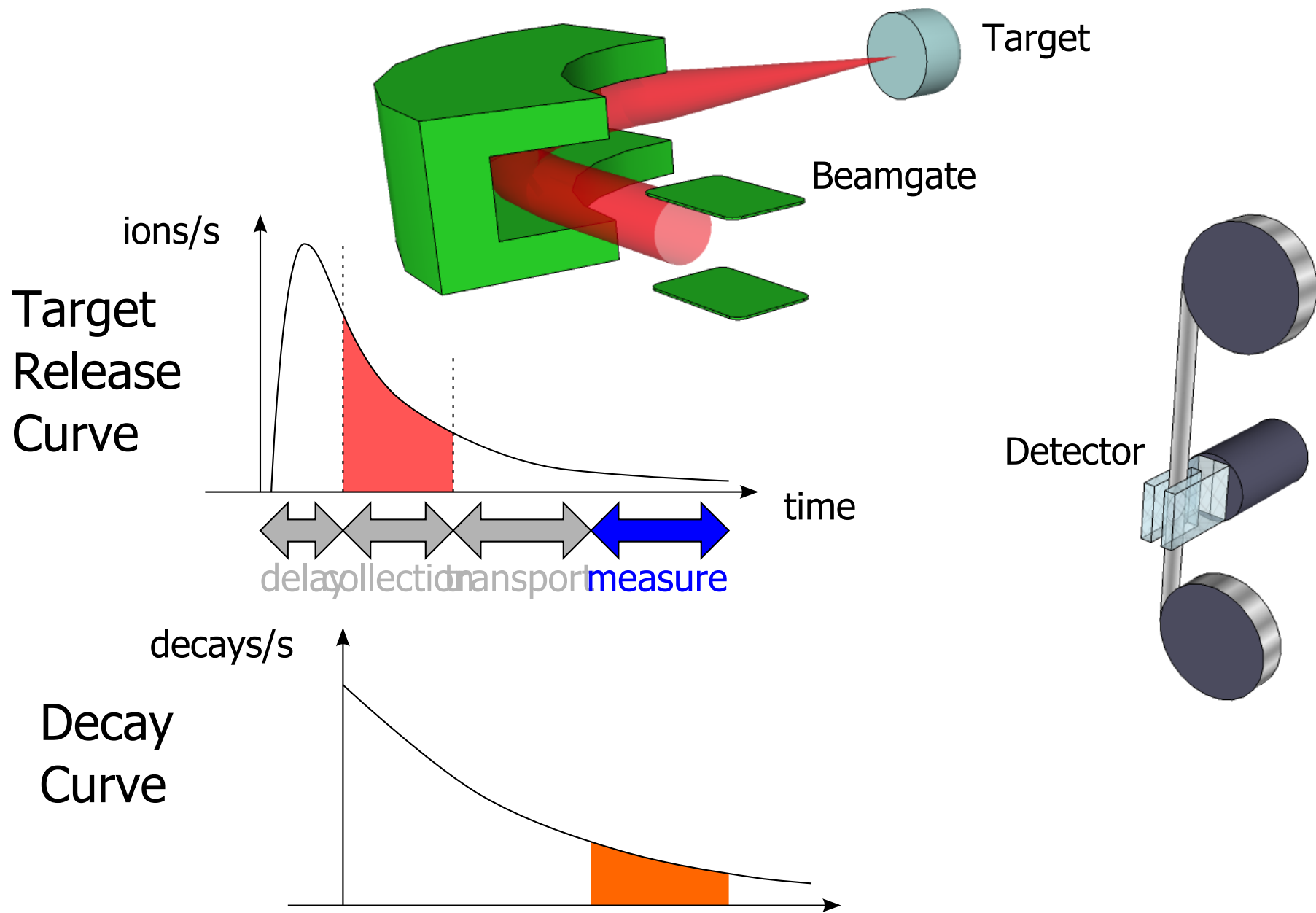
Measurement Cycle: Collection



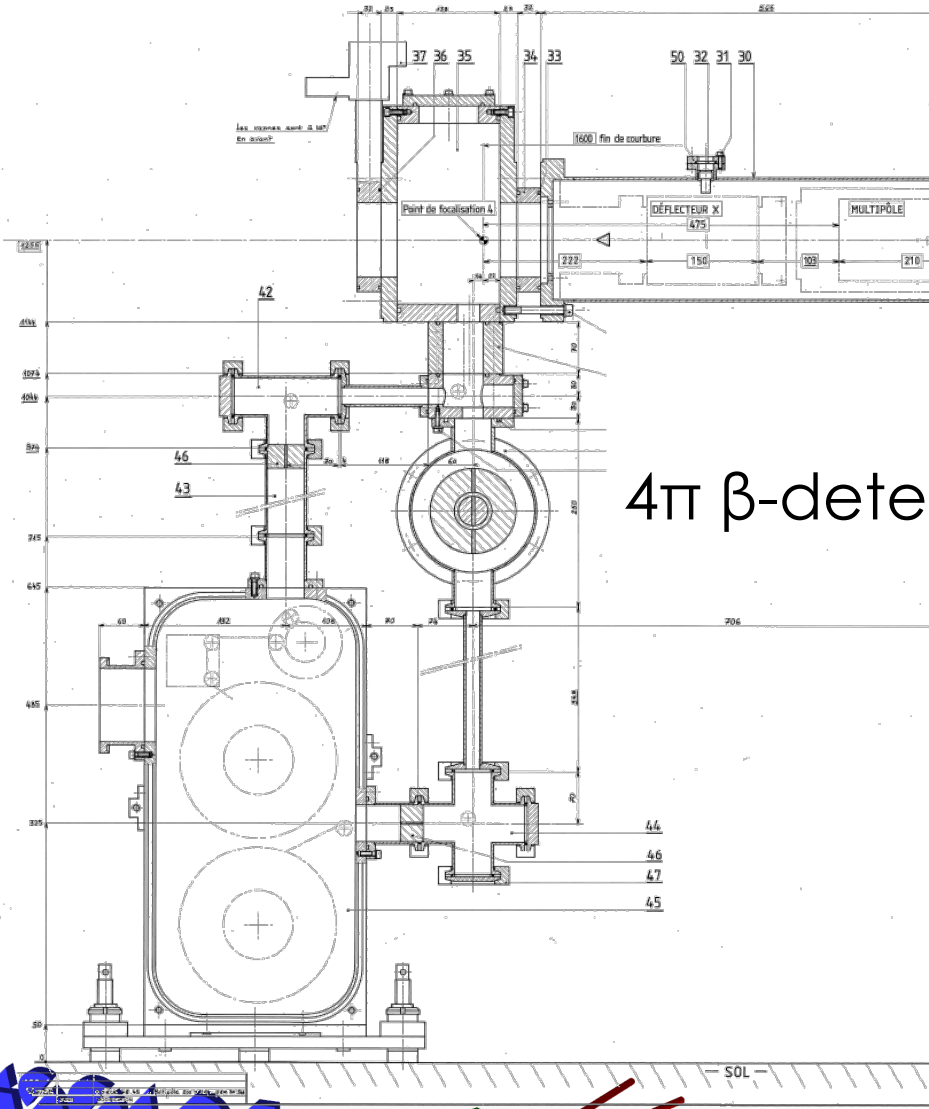
Measurement Cycle: Transport



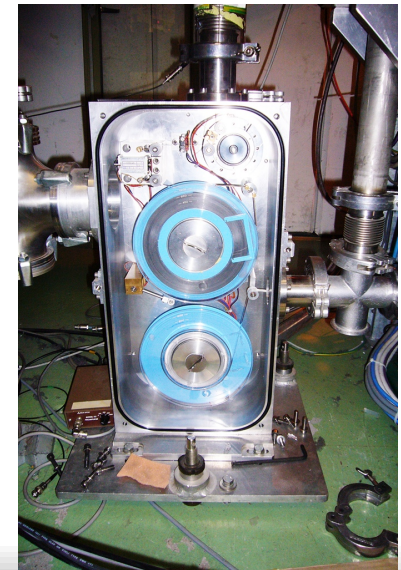
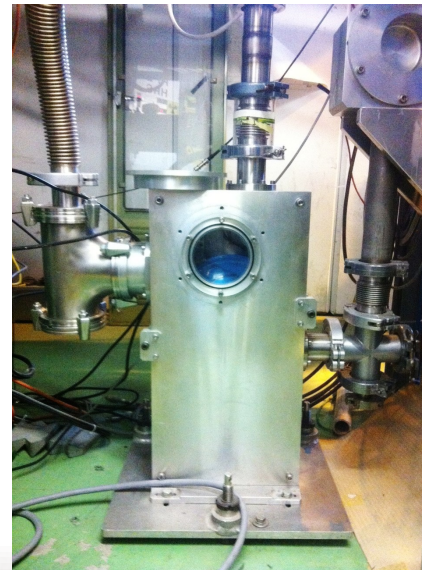
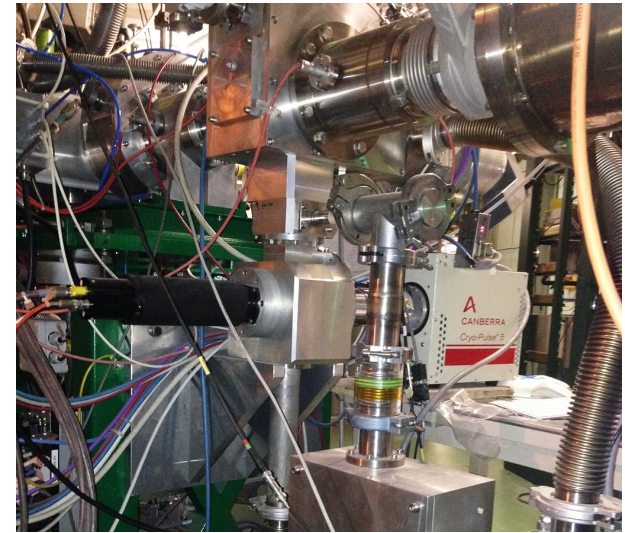
Measurement Cycle: Measure



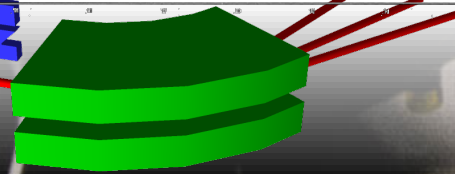
Tapestation Upgrade



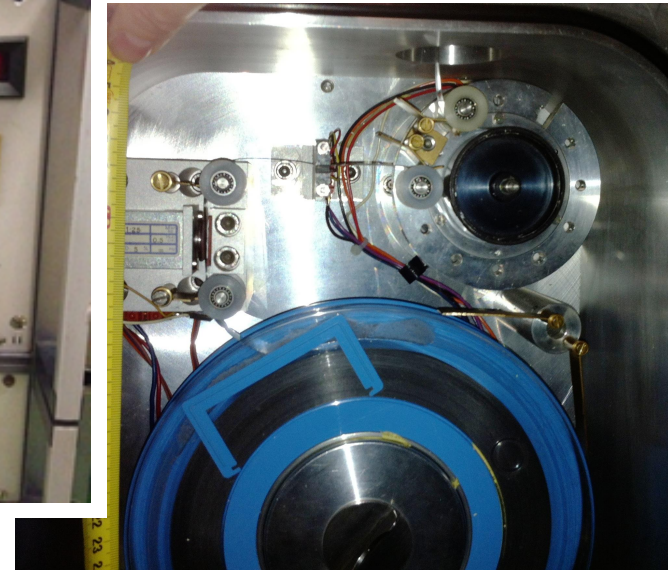
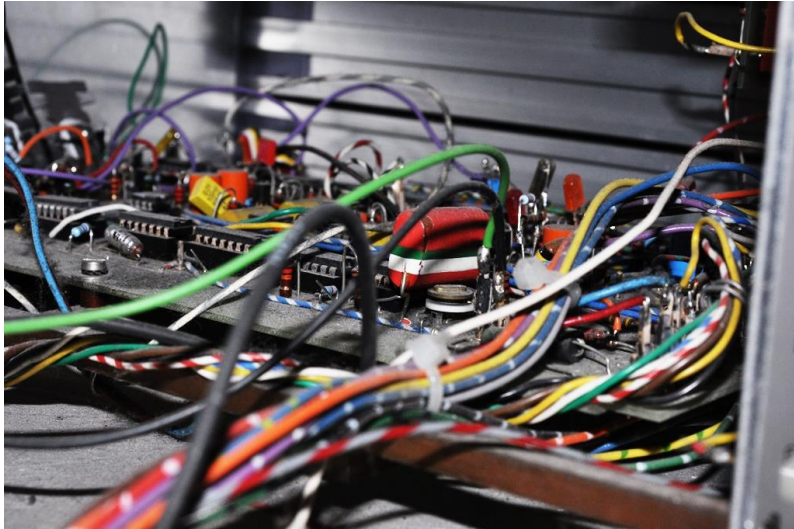
4π β-detector



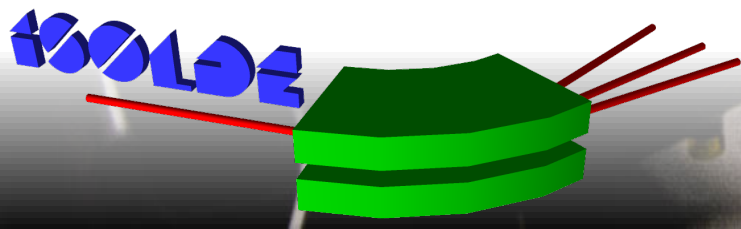
100LDE



Tapestation Upgrade



Transport time : ~1000 ms



Key design points

Detectors:

- Point 2 shielded by lead block with slots for tape
- Separate general-purpose measurement point

Control:

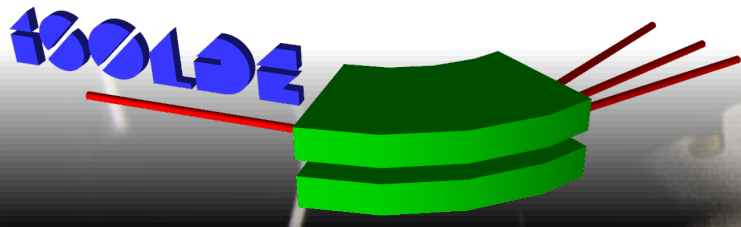
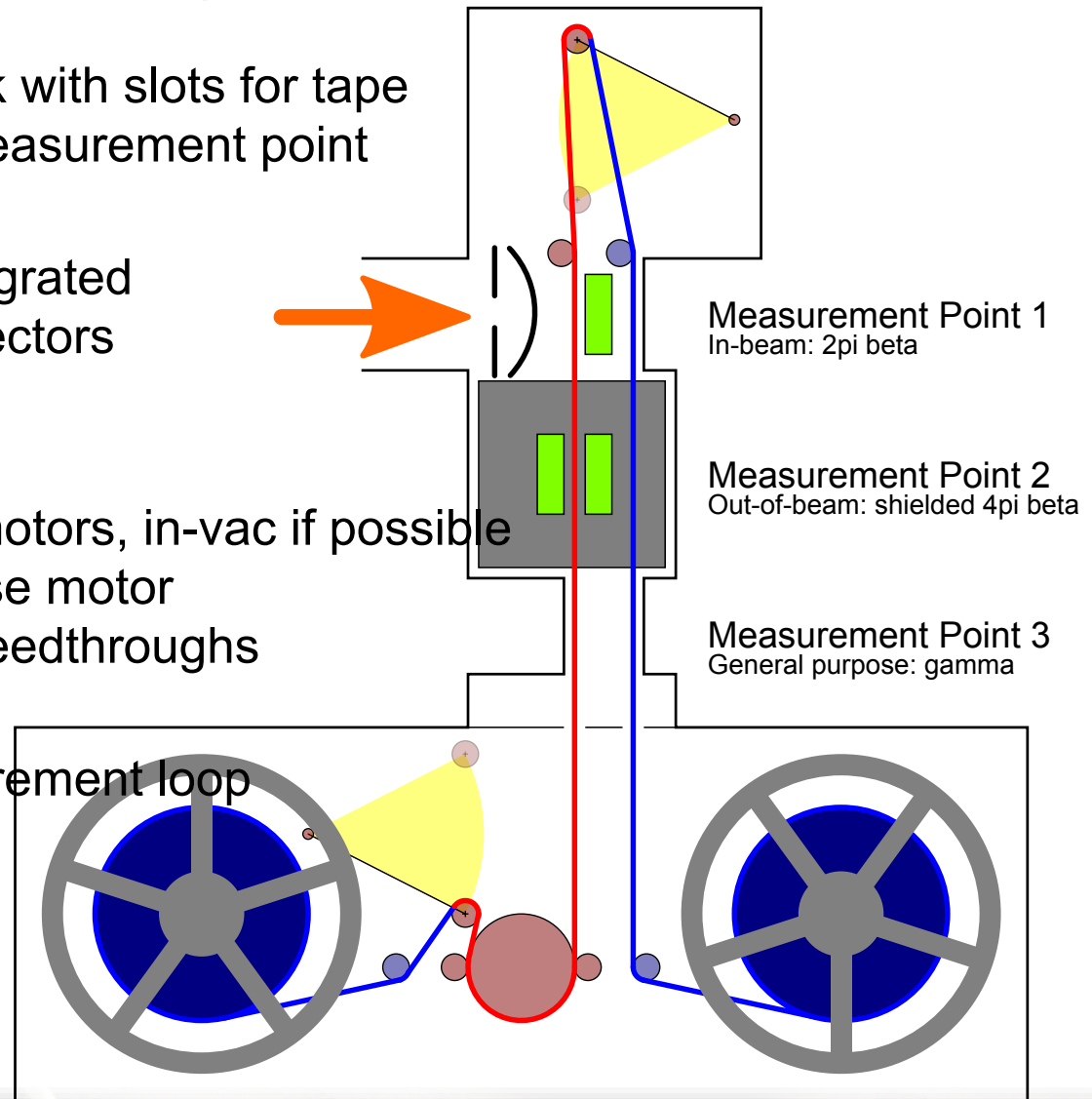
- Timing and motor control integrated
- Separate fast counter for detectors
- Integrated gamma PHA

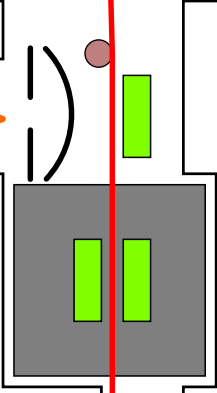
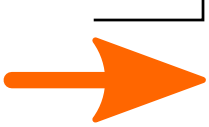
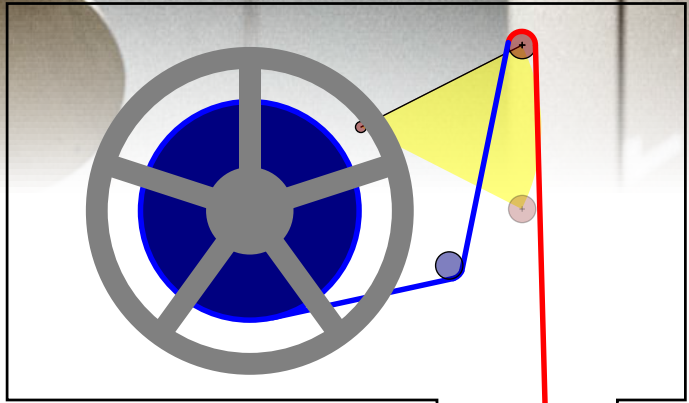
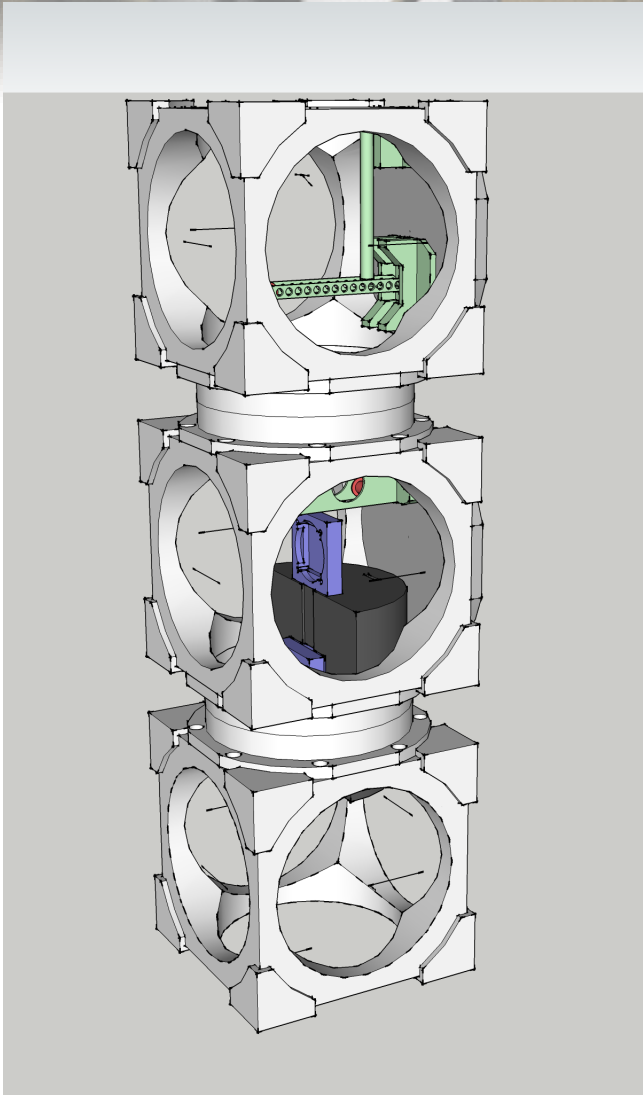
Motors:

- Reels separated from measurement loop
- Capstan moved by fast precise motor
- Planetary gears on vacuum feedthroughs

Vacuum:

- Reels separated from measurement loop

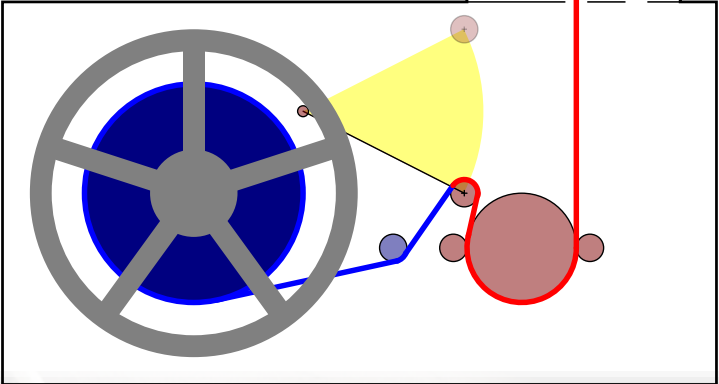




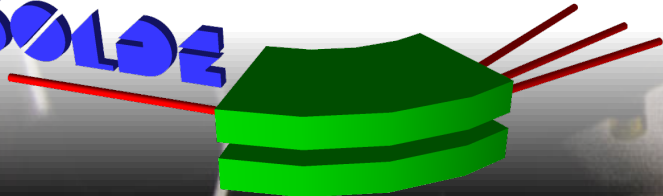
Measurement Point 1
In-beam: 2π beta

Measurement Point 2
Out-of-beam: shielded 4π beta

Measurement Point 3
General purpose: gamma



FOOLDE



Specification

In-beam $2\pi\beta$

Out-of-beam $4\pi\beta$

Out-of-beam γ

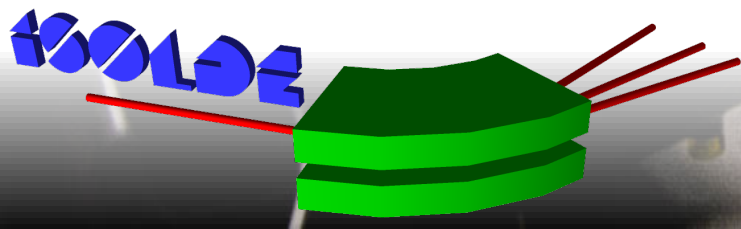
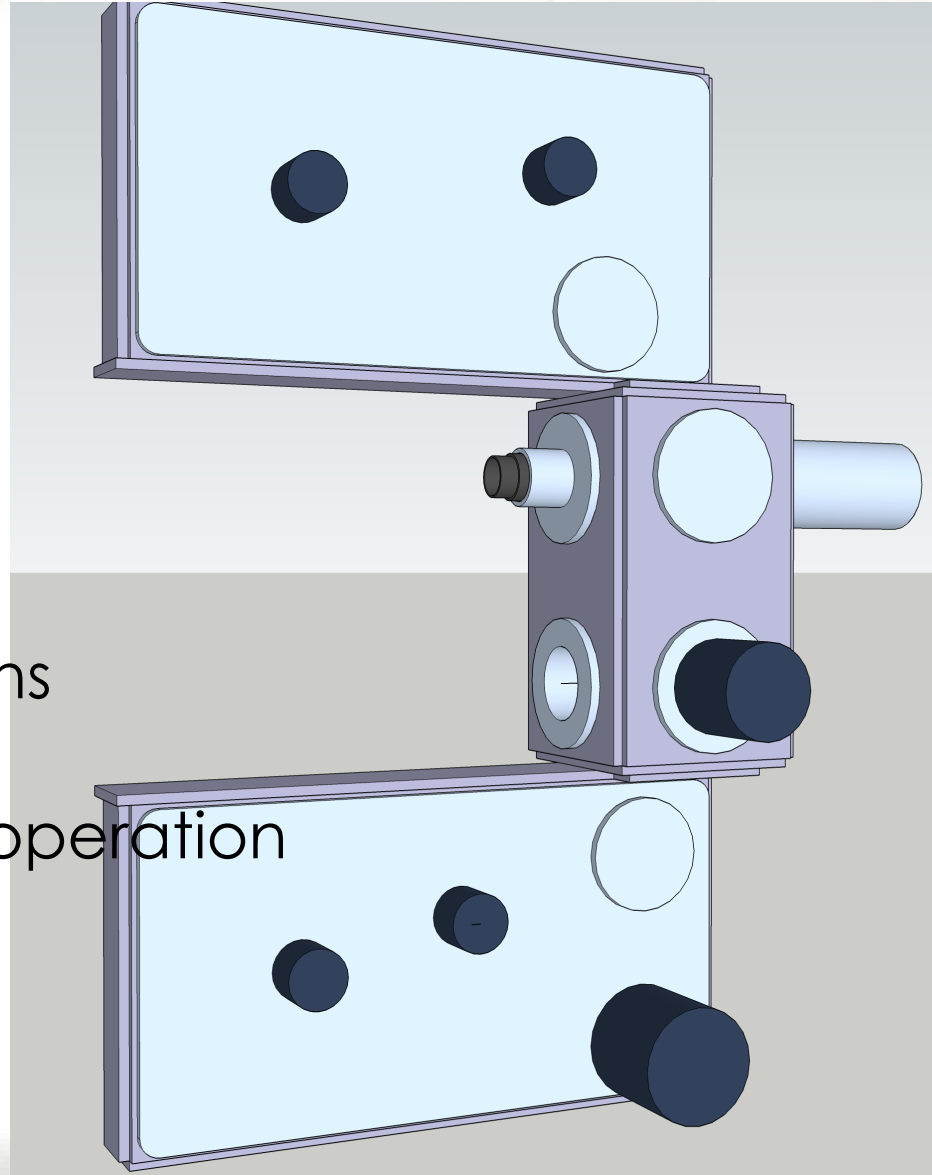
Low inertia suspension

Fast transport 100-200ms

Separated vacuum sections

Robust design

Suitable for non-specialist operation



Specification

In-beam $2\pi\beta$

Out-of-beam $4\pi\beta$

Out-of-beam γ

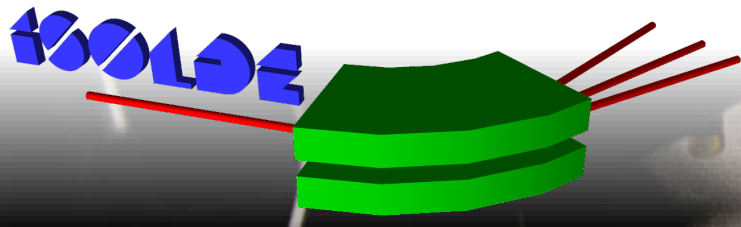
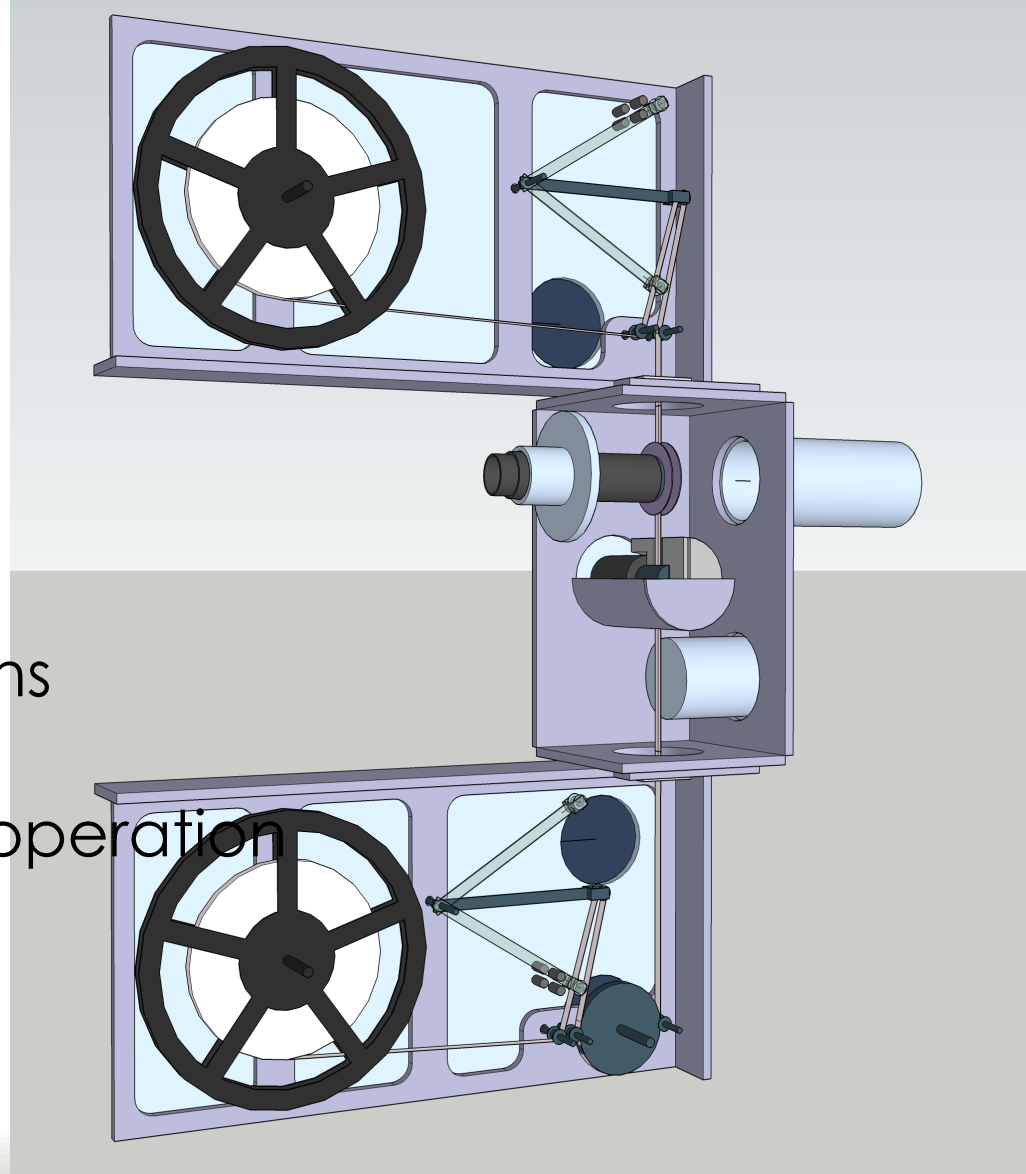
Low inertia suspension

Fast transport 100-200ms

Separated vacuum sections

Robust design

Suitable for non-specialist operation



Specification

In-beam $2\pi\beta$

Out-of-beam $4\pi\beta$

Out-of-beam γ

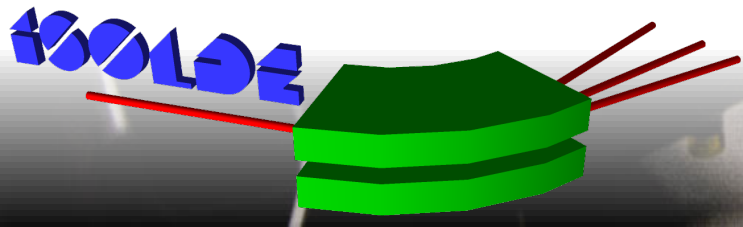
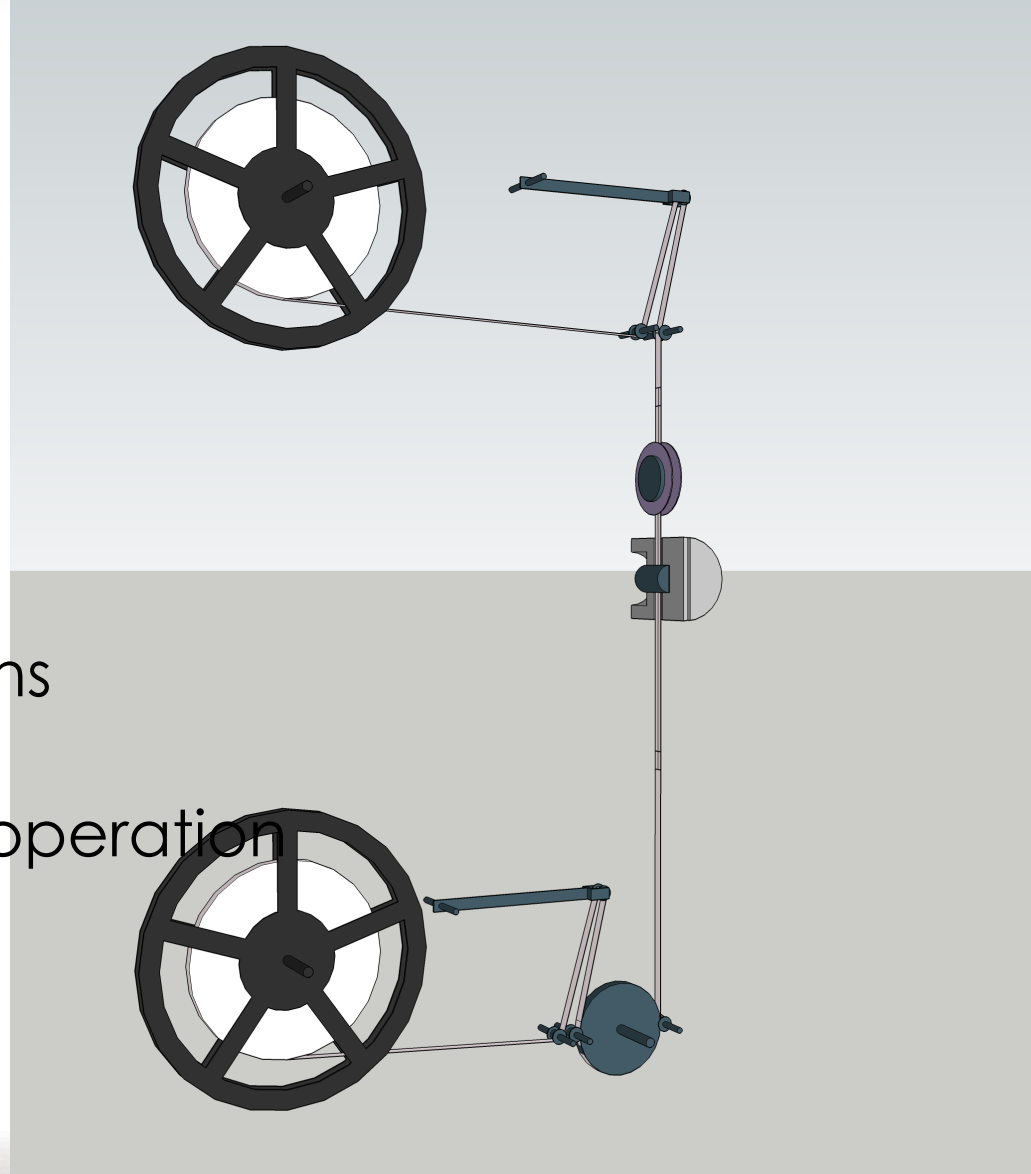
Low inertia suspension

Fast transport 100-200ms

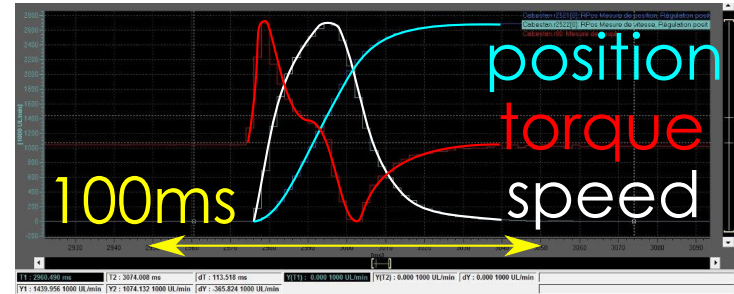
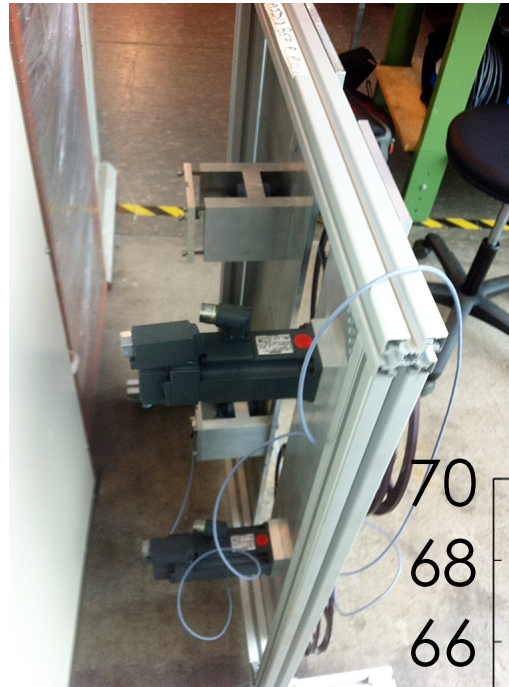
Separated vacuum sections

Robust design

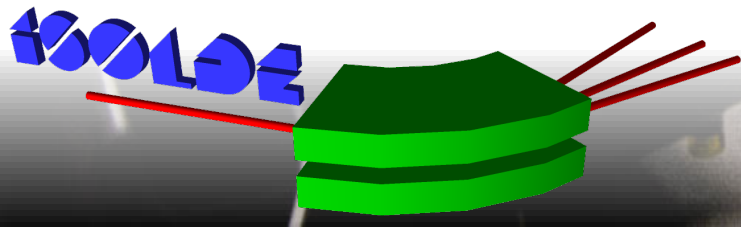
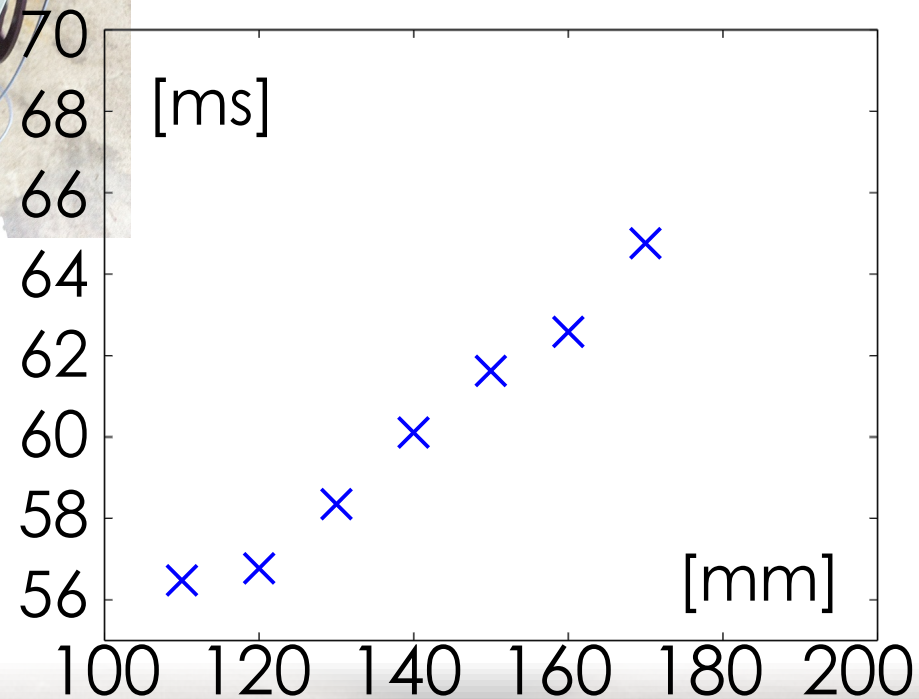
Suitable for non-specialist operation



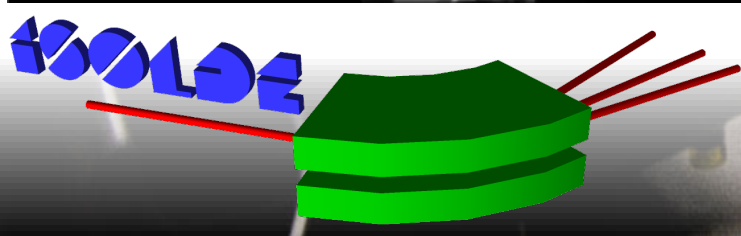
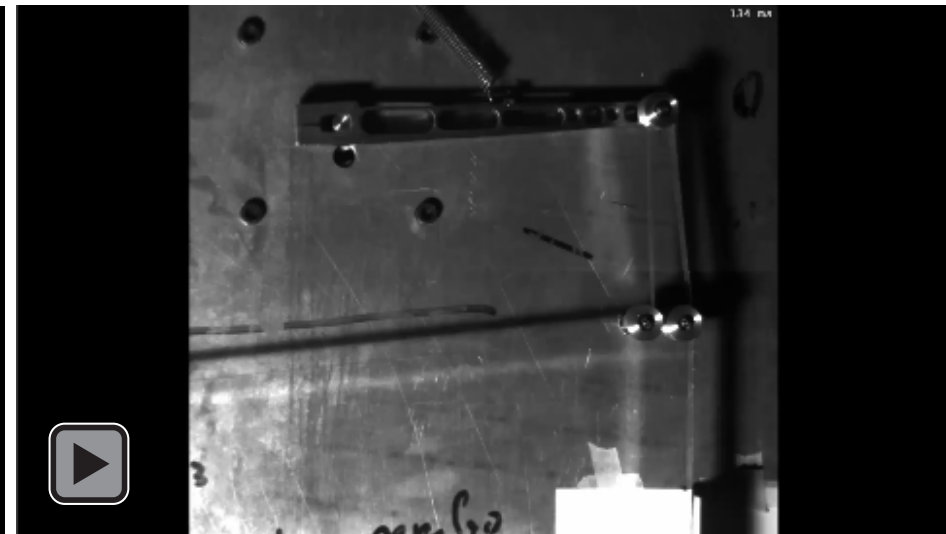
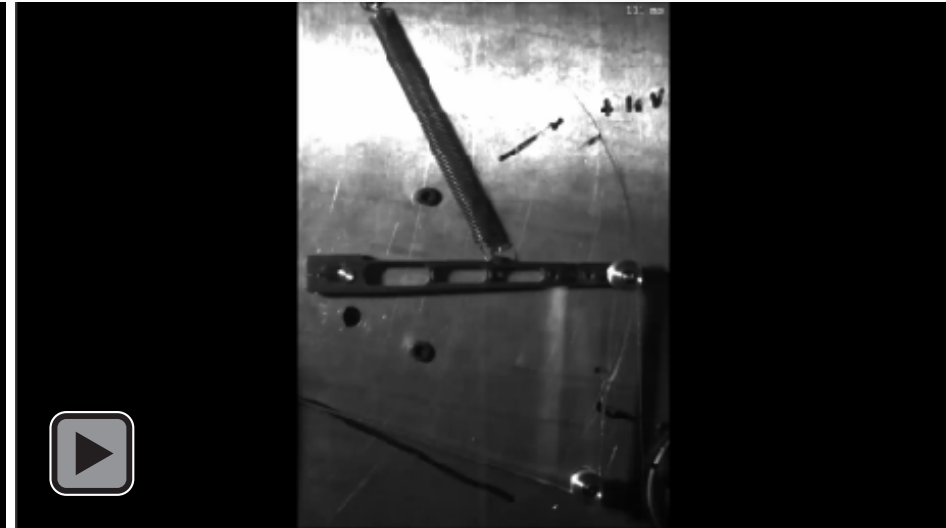
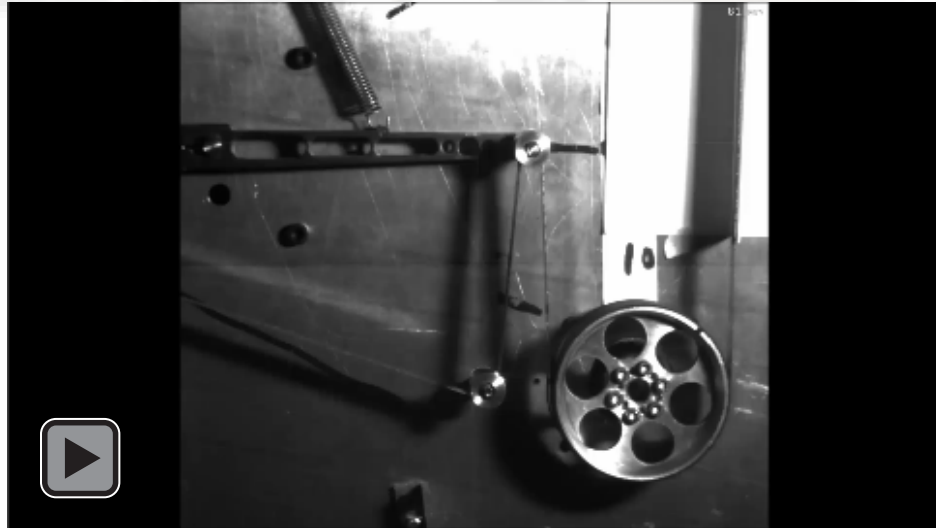
FTS "demonstrator"



Optimised capstan diameter
Transport time < 100 ms
Precision < 1 mm

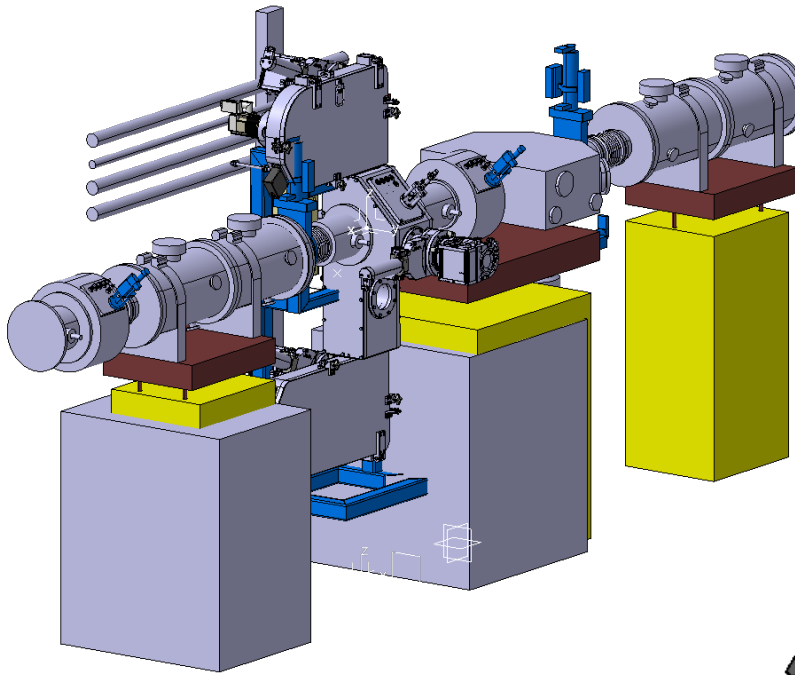


Demonstrator

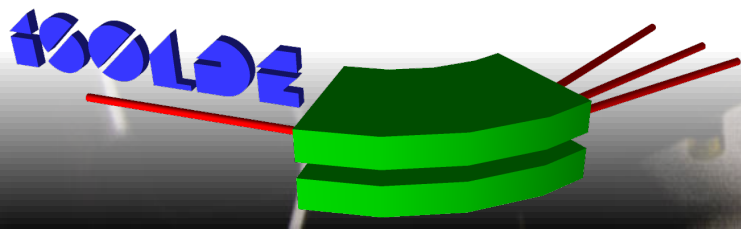
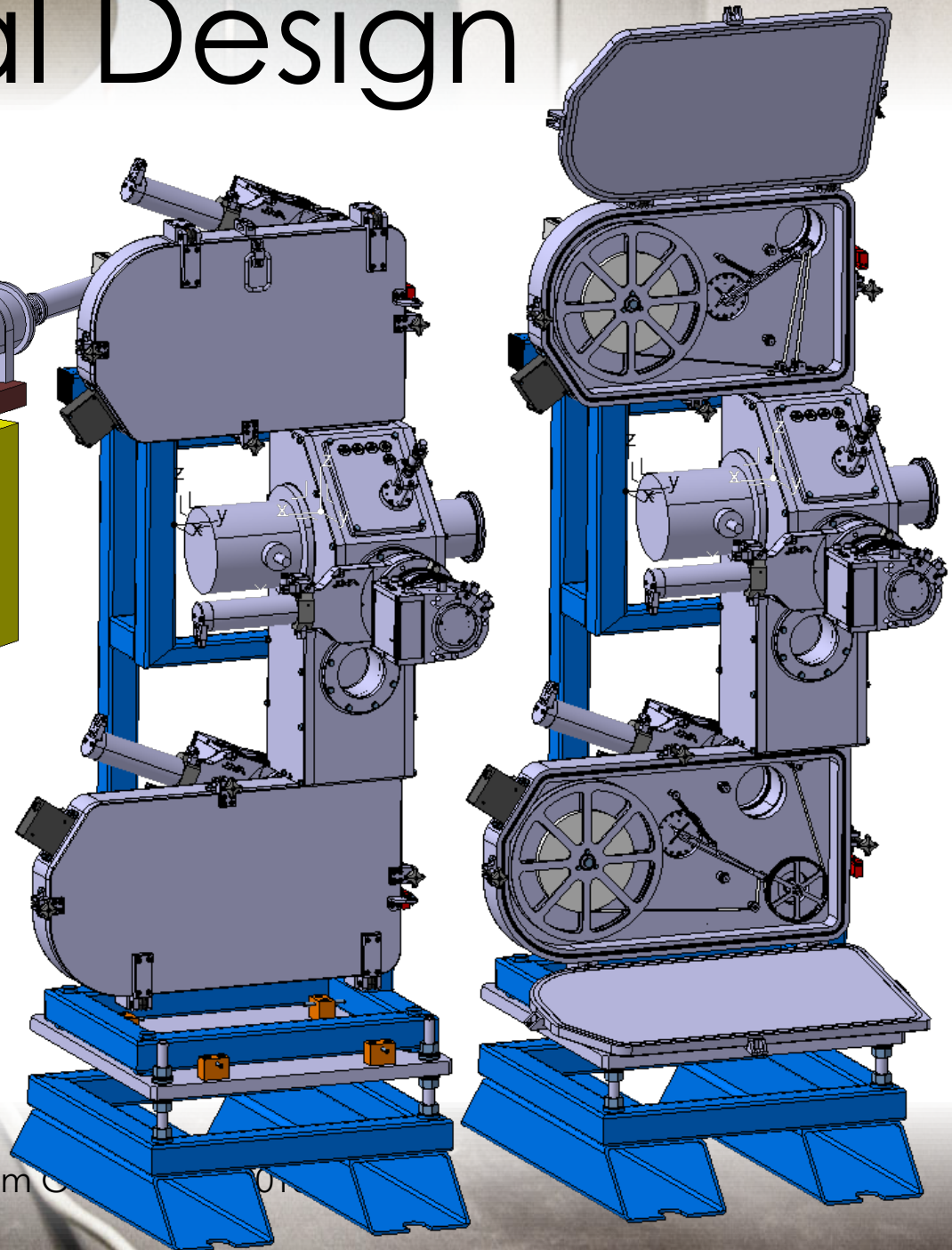


Tim Giles --- Dec 2015

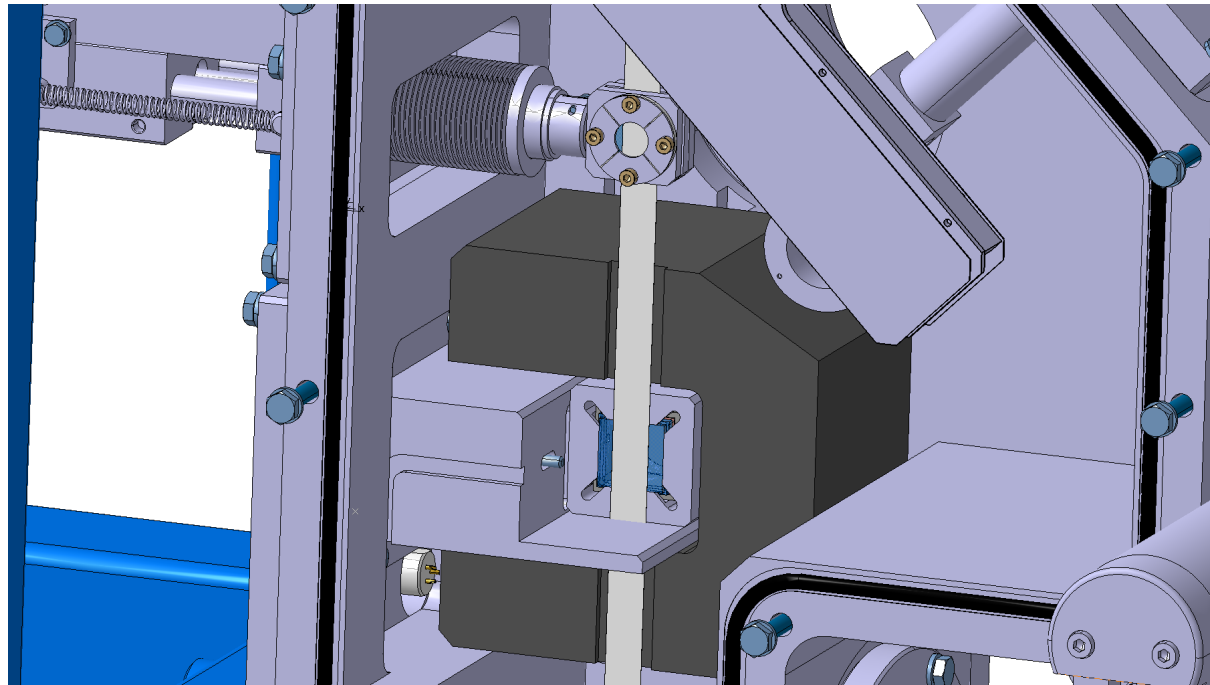
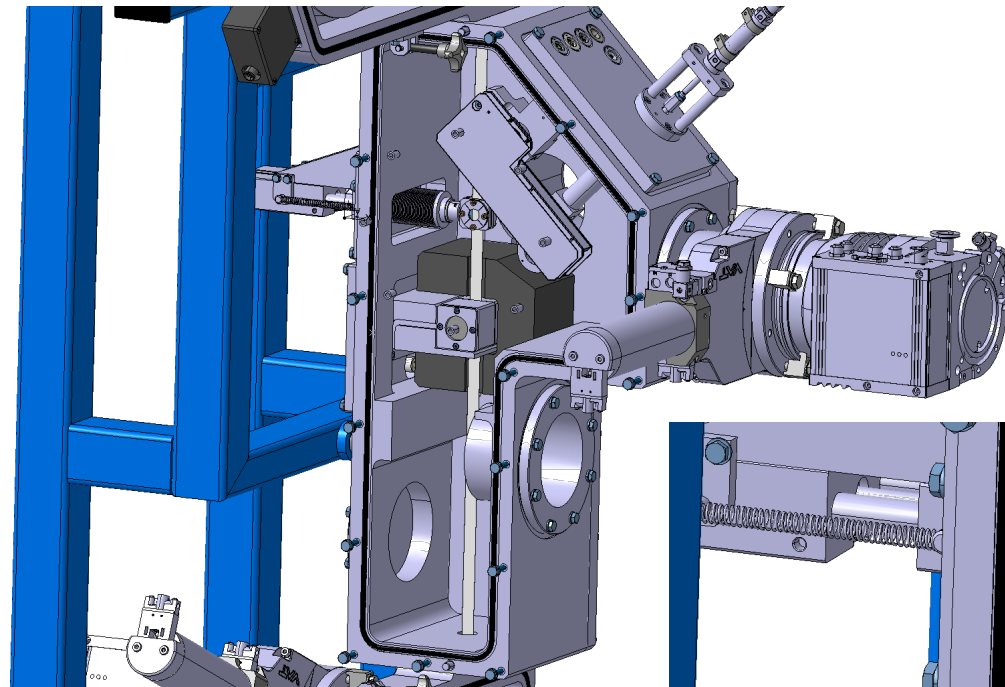
Final Design



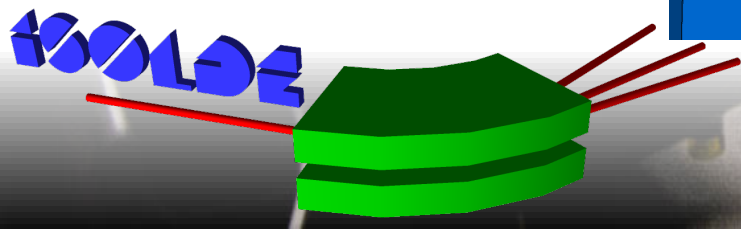
Drop-in compatibility
with CA0 beamline



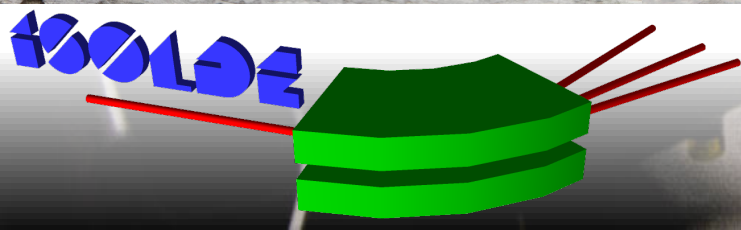
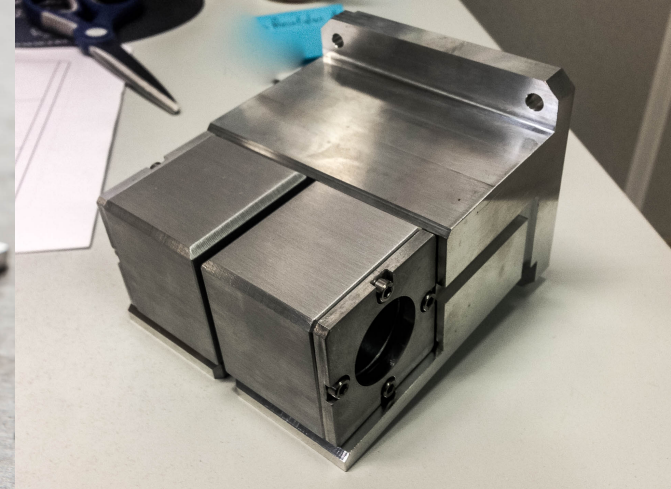
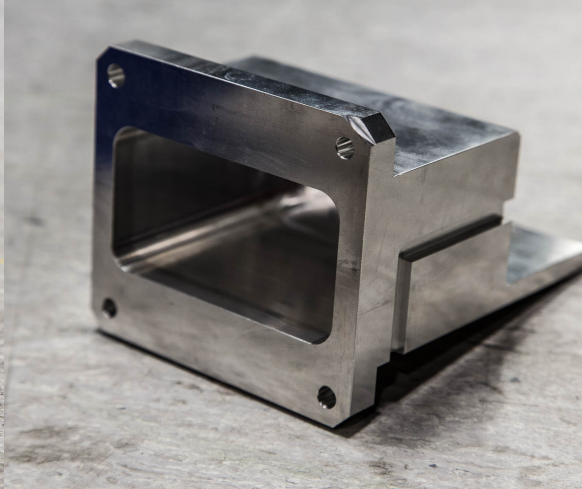
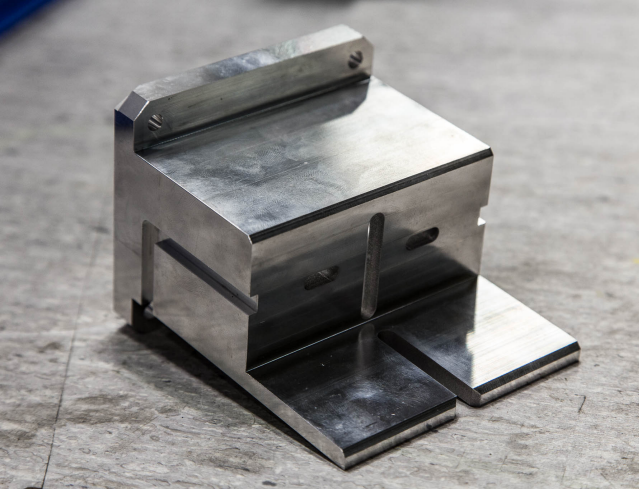
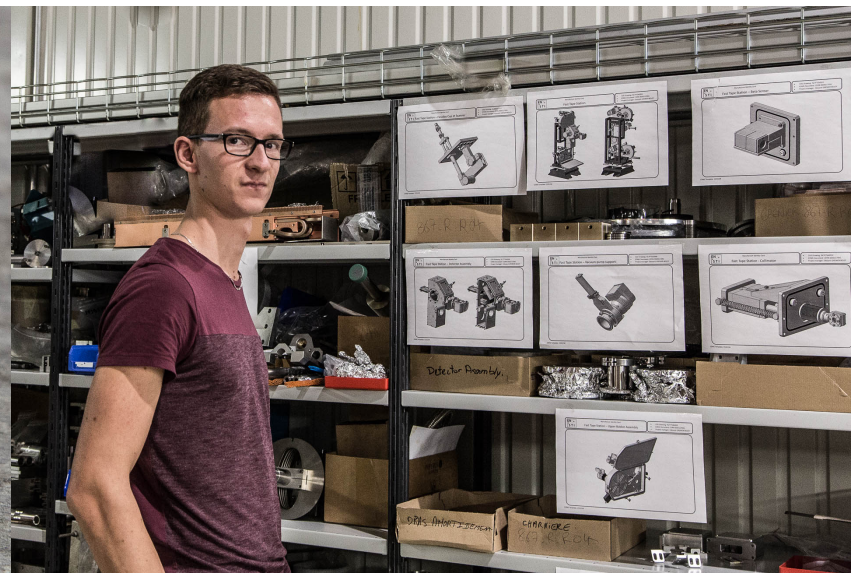
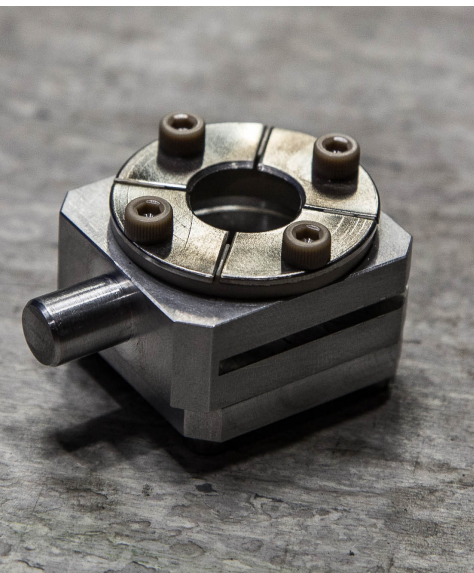
Detector box



"Slot" for HPGe
Spare "slot"

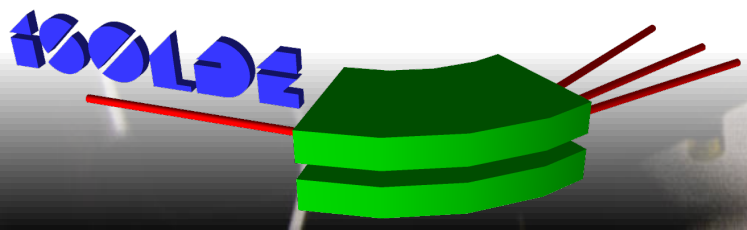
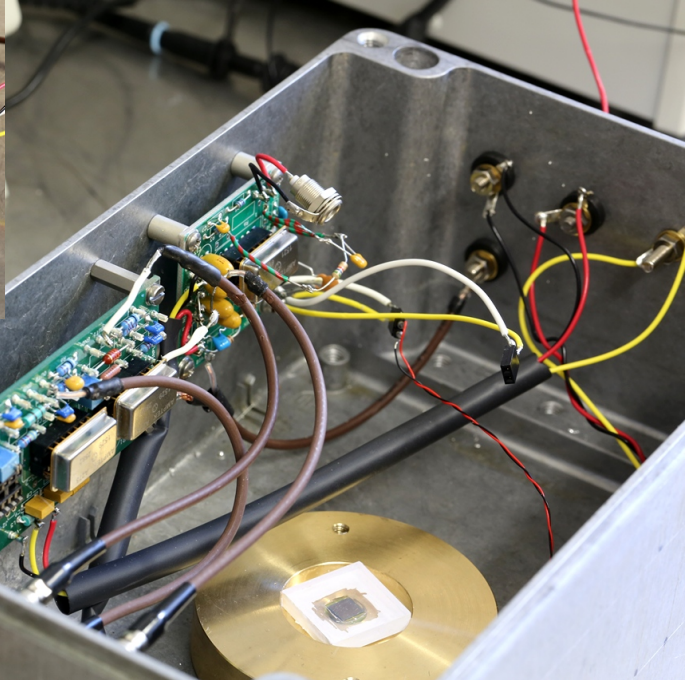
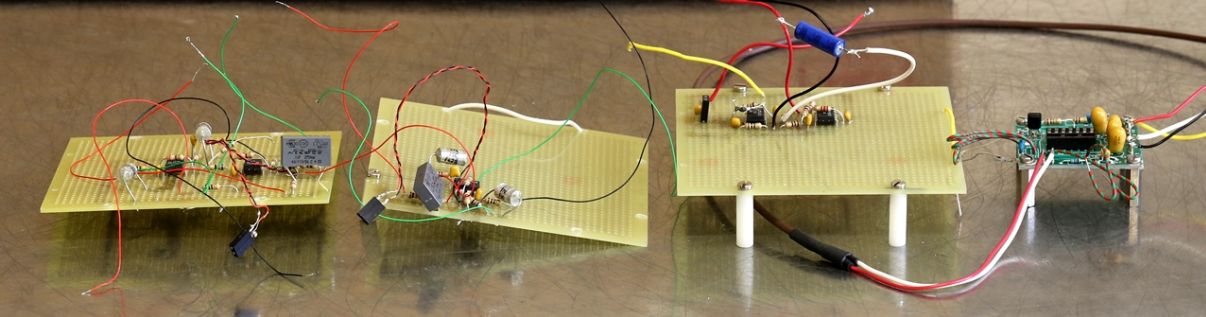
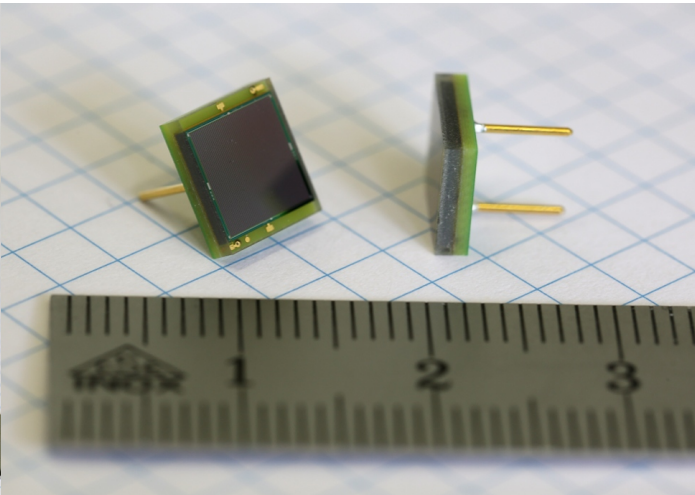
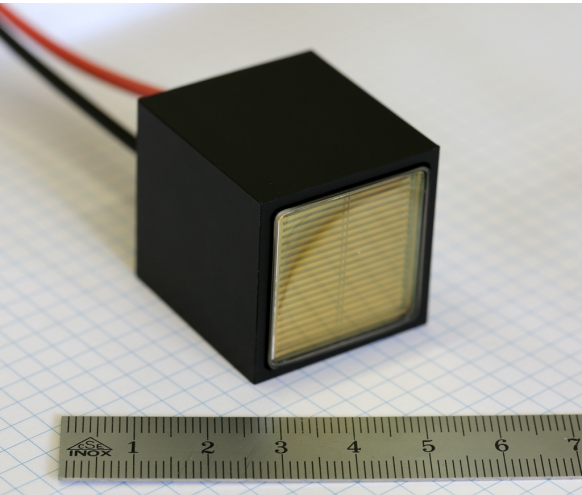


Mechanics: Edouard Grenier-Boley



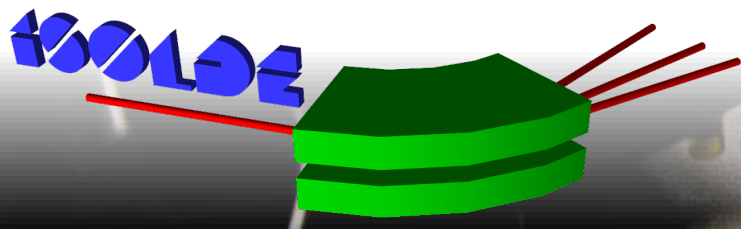
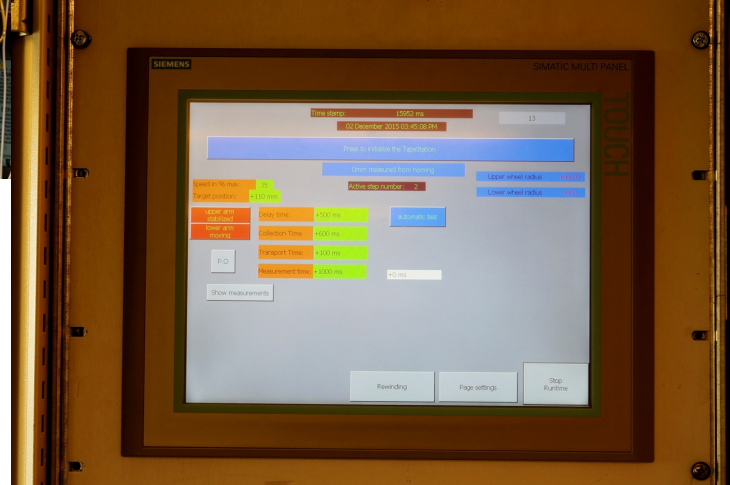
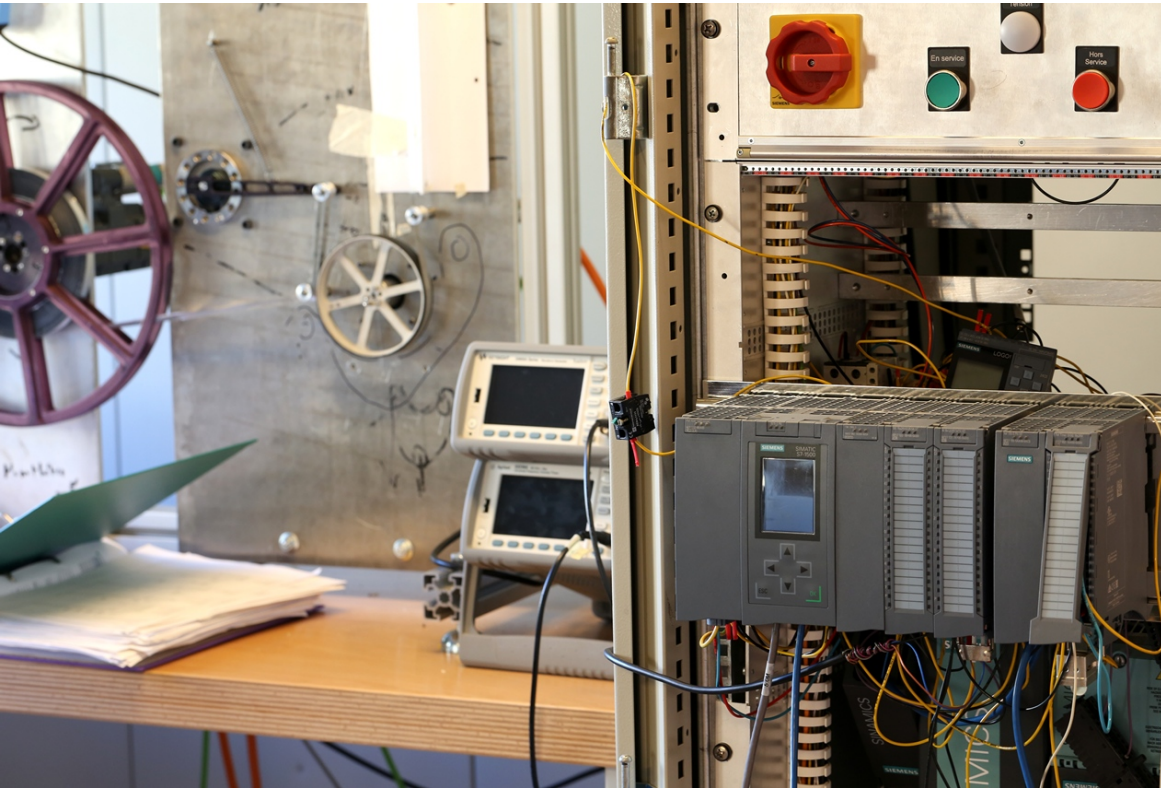
Tim Giles --- Dec 2015

Detectors: James Fitzgibbon



Tim Giles --- Dec 2015

Controls: Thierry Feniet



Tim Giles --- Dec 2015

Installation

3D design

Done

Blueprints

Done

Construction

Started

Detector development

Ongoing

Offline commissioning

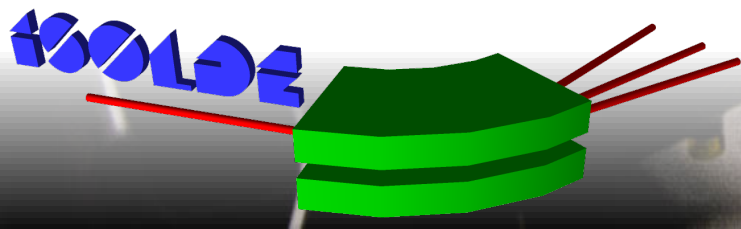
Feb 2016

Online commissioning

2016 at LA2

Final installation

2016/17 shutdown



Software

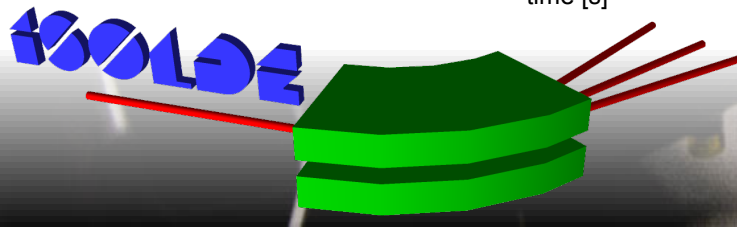
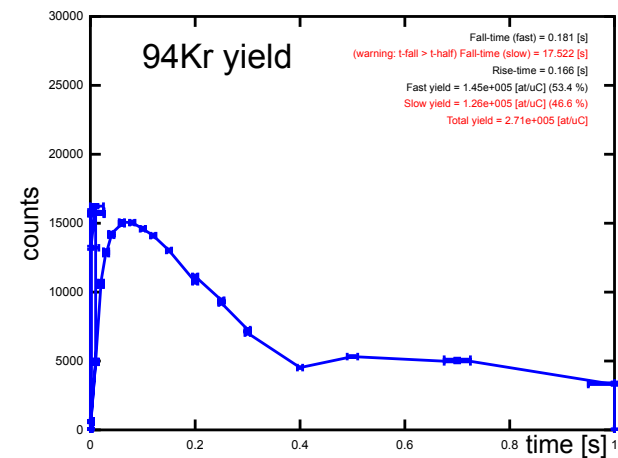
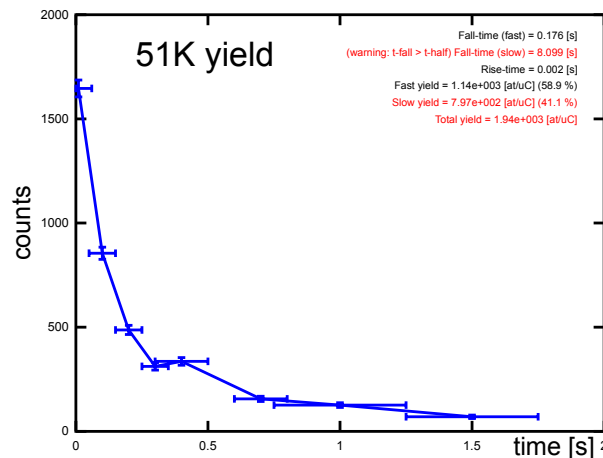
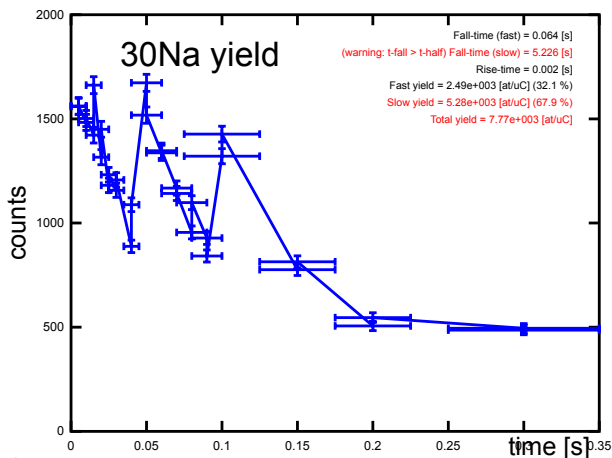
Merge data-taking with automatic yield analysis

Automate release curve measurement

Automatic proton-target scans

Decay curves

Integrated yields over target lifetime



Acknowledgments

Edouard Grenier-Boley

Thierry Feniet

James Fitzgibbon

Ramon Folch

Krzysztof Adam Szczurek

Alexandre Pascal Perez

Francois Nicolas Morel

Jose Briz

