

Status of the sc cw LINAC project

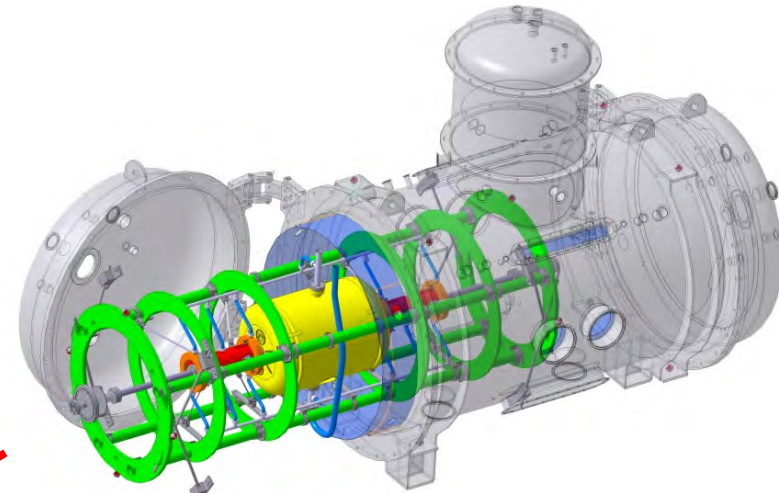
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- 3. The sc cw Demonstrator Status**
- 4. Timeclock**

What is the sc cw LINAC? -The first step-

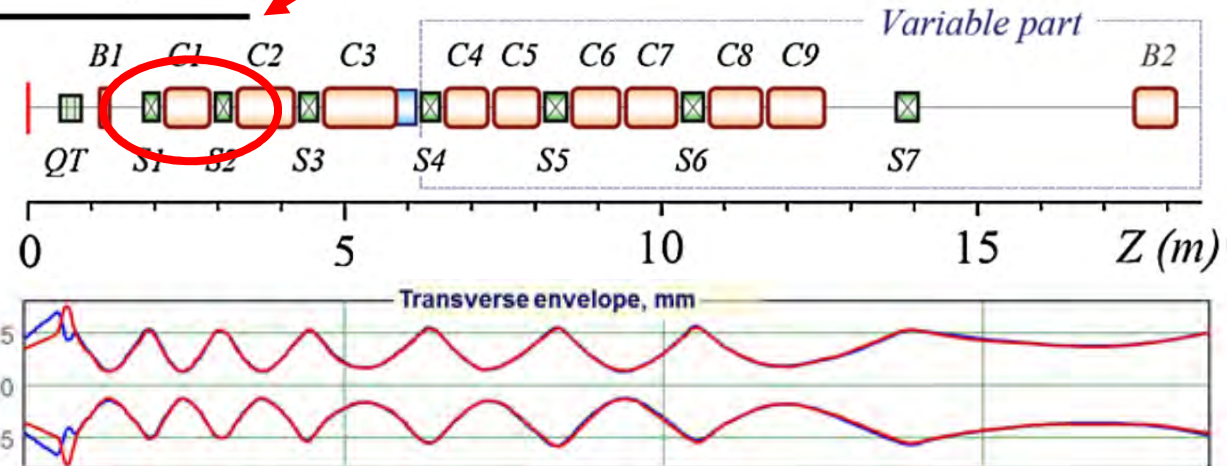
Table 1: General Parameters of the cw-LINAC

Mass/Charge		6
Frequency	MHz	217
max. beam current	mA	1
Injection Energy	MeV/u	1.4
Output energy	MeV/u	3.5 – 7.3
Output energy spread	keV/u	+ - 3
Length of acceleration	m	12.7
Sc CH-cavities		9
Sc solenoids		7



Minaev et al (IAP, 2009)

- variable output energy
- compact design
- optimal to GSI HLI
- low operating costs

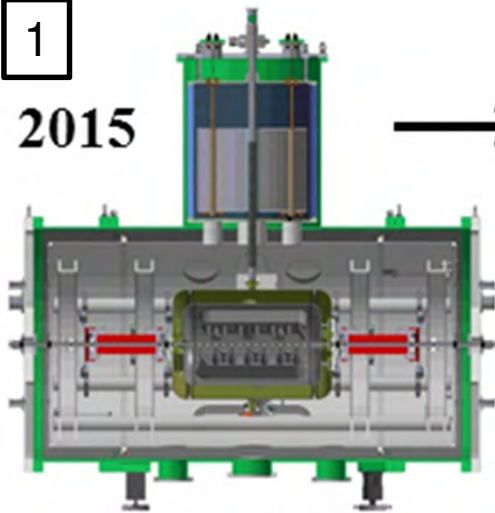


Three steps



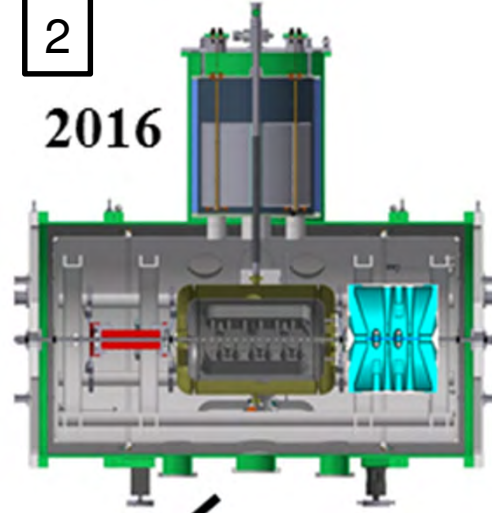
1

2015



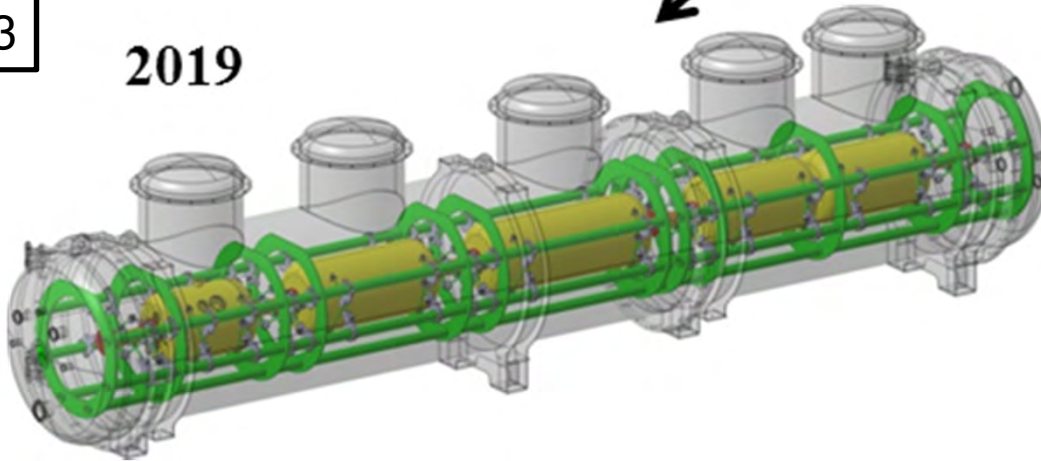
2

2016



3

2019



1. Full performance test of sc cw LINAC Demonstrator

- @GSI HLI
- proof of principle

2. Full performance test of a shorter sc cavity

- energy variation (by Ampl & Phase)
- 8 gaps
- simpler design
- easier to fabricate

3. Advanced Demonstrator

- up to 4.61 MeV/u @ $a/q=6$
- 5x sc CH-Cavity, 5x sc Solenoid
- possible to place in HLI@GSI

The third step, Advanced Demonstrator

THPWO007

Proceedings of IPAC2013, Shanghai, China

ADVANCED SUPERCONDUCTING CW HEAVY ION LINAC R&D *

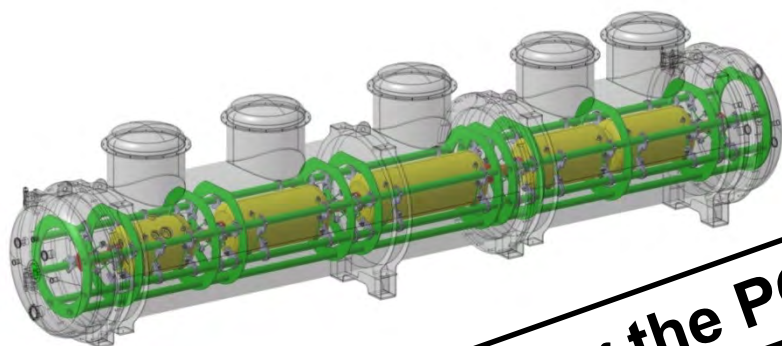
W. Barth^{1,2}, K. Aulenbacher^{2,4}, F. Dziuba³, M. Amberg^{2,3}, V. Gettmann²,
S. Jacke², S. Mickat^{1,2}, A. Orzhekovskaya^{1,2}, H. Podlech³, U. Ratzinger³

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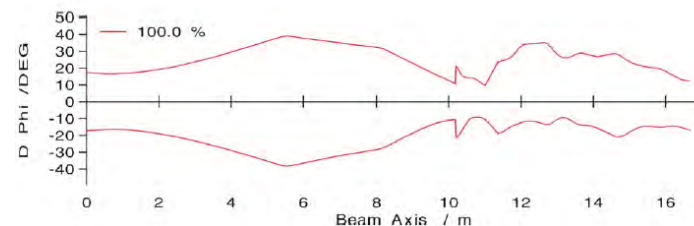
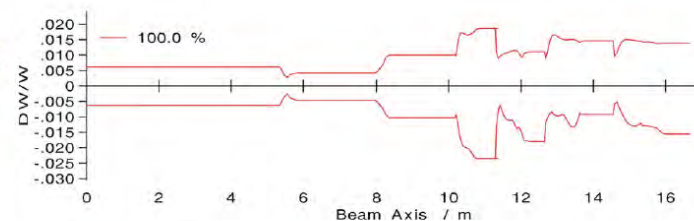
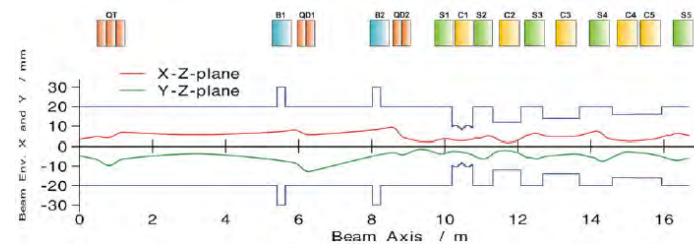


Evaluated for the POF3



Timetable sc-cw-LINAC

2014	Specification of short cavity
2015	Full performance test of Demonstrator @ GSI HLI
2016	Specification of next cavities
2019	Full performance test of advanced Demonstrator @ GSI HLI



Demonstrator

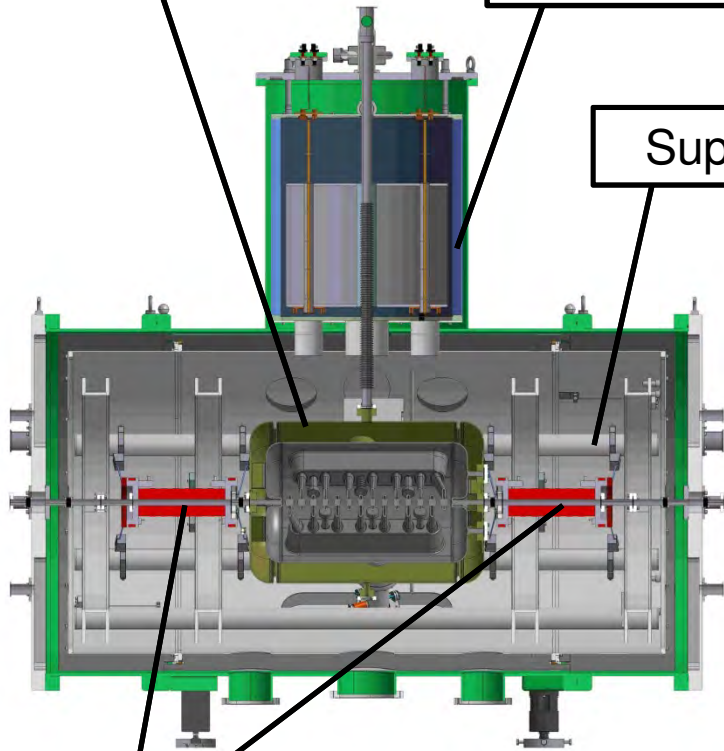


217 MHz Cavity

LN / LHe reservoir

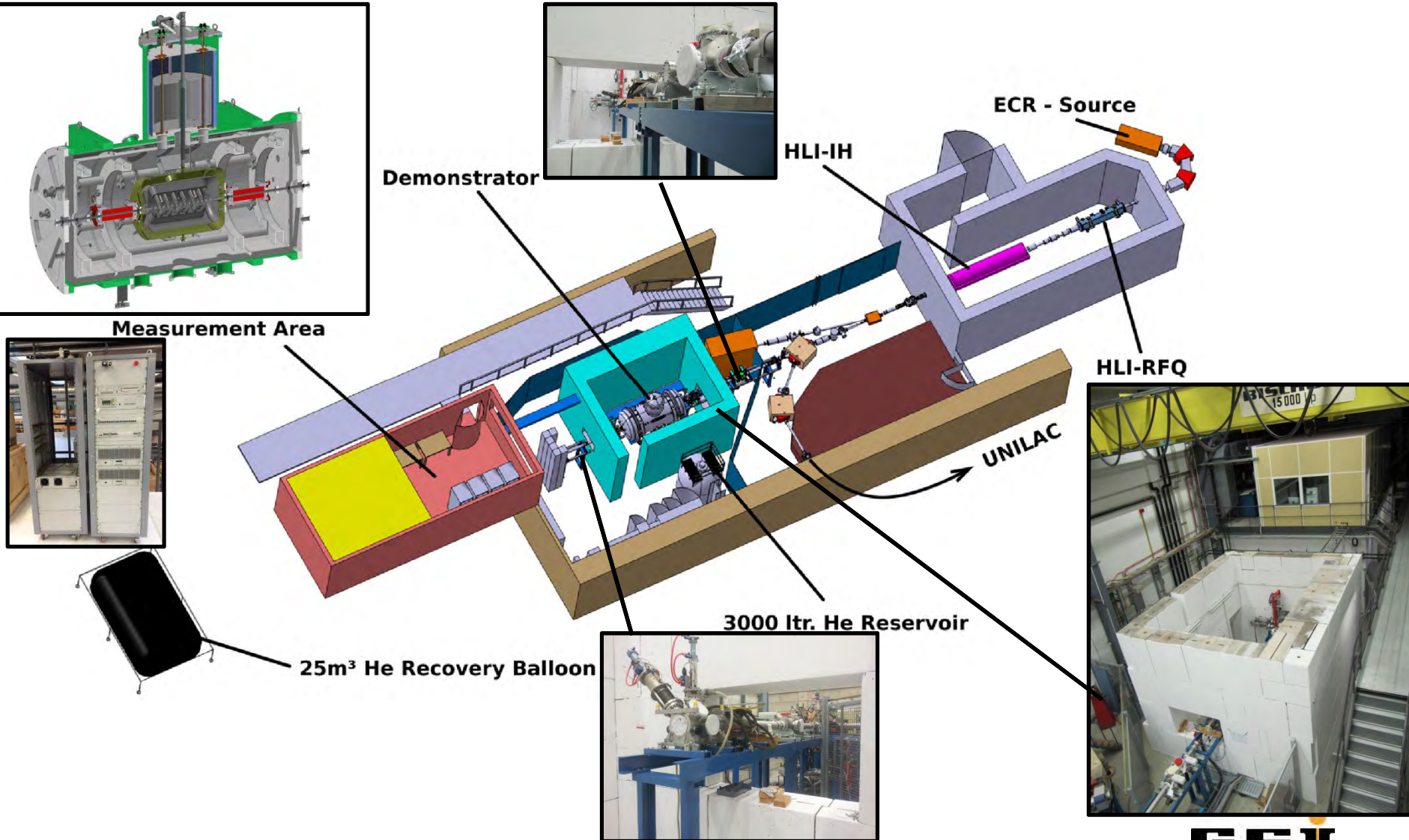
Support frame

Solenoids

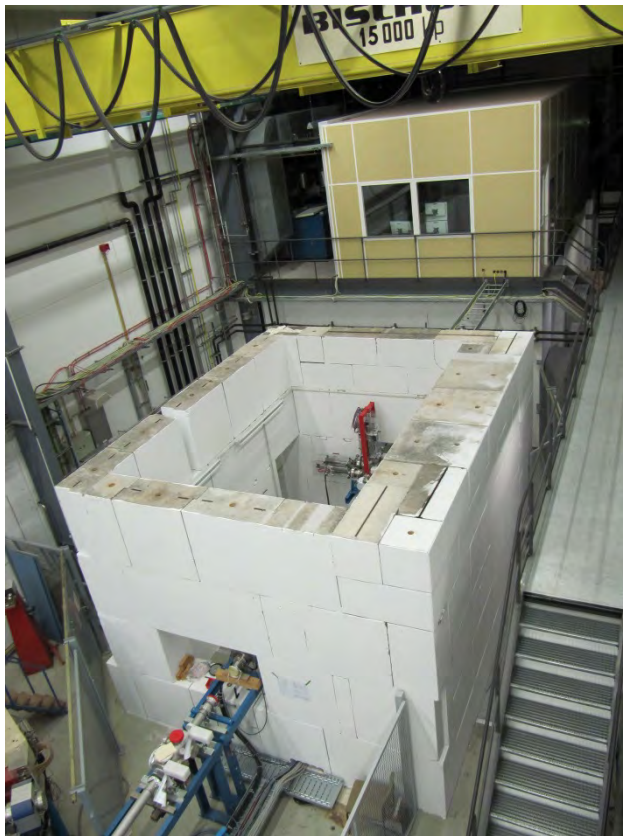


Inner length (mm)	2200
Inner diameter (mm)	1120
Material tank	Aluminium
Position stability of fiducials to each other (μm)	± 25
Isolation vacuum (mbar)	$< 10^{-5}$
Total leak rate (mbar*l/s)	10^{-9}
Max. operation pressure (bar)	$< 0,5$
Operation temperature (K)	4,4
Temperature nitrogen shield (K)	77
Material magnetic shielding	μ - Metal (2mm)
Transversal / Longitudinal tolerance (mm)	$\pm 0.2 / \pm 2$
Shielding factor of earth magnetic field	20
Max. static losses in stand-by operation (W)	< 10
Cold-warm-transition (beam-pipe) - gradient (K/cm)	10

Demonstrator Project @ GSI HLI

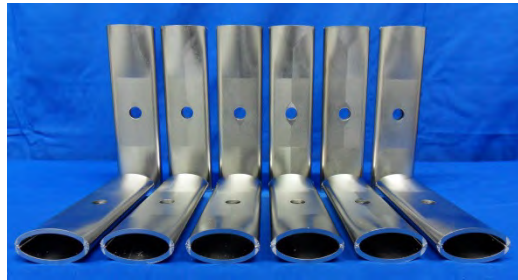


What is the status?



test stand is prepared

217 MHz sc CH-Cavity



325 MHz Cavity

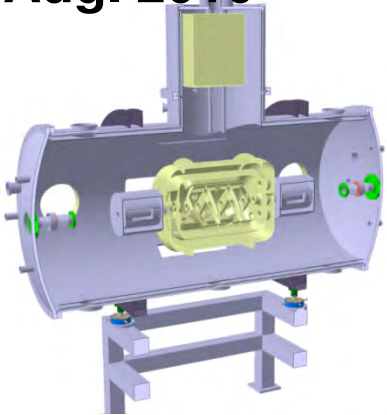


fabrication of 217 MHz sc Cavity

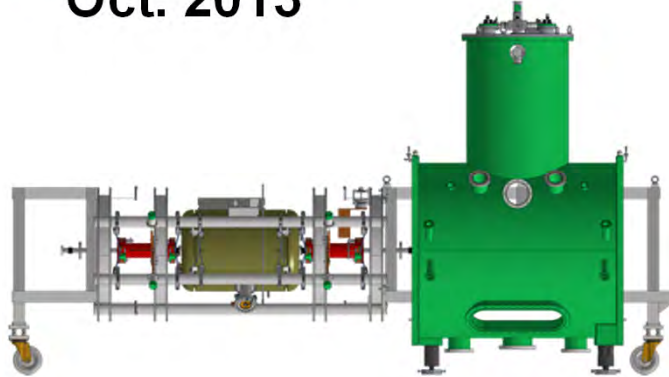


Cryostat

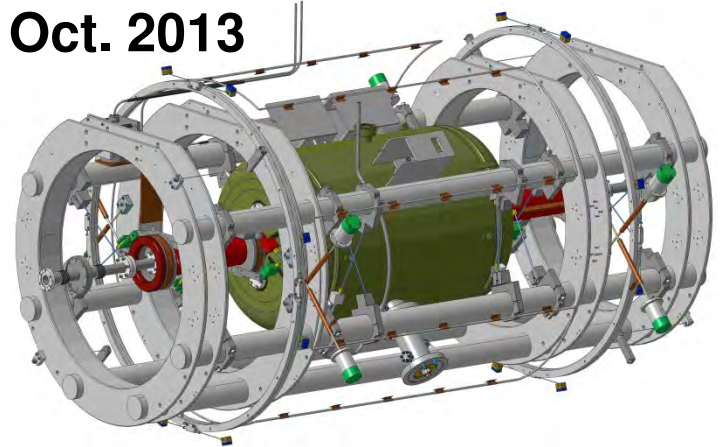
Aug. 2010



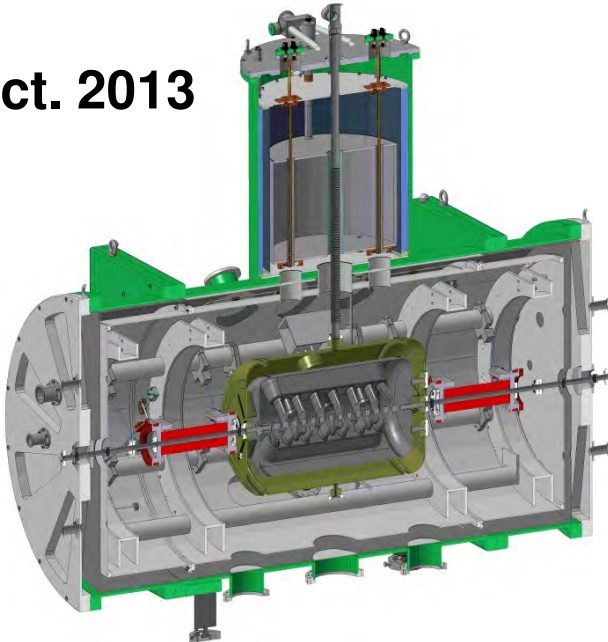
Oct. 2013



Oct. 2013



Oct. 2013



Oct. 2014



Time clock

