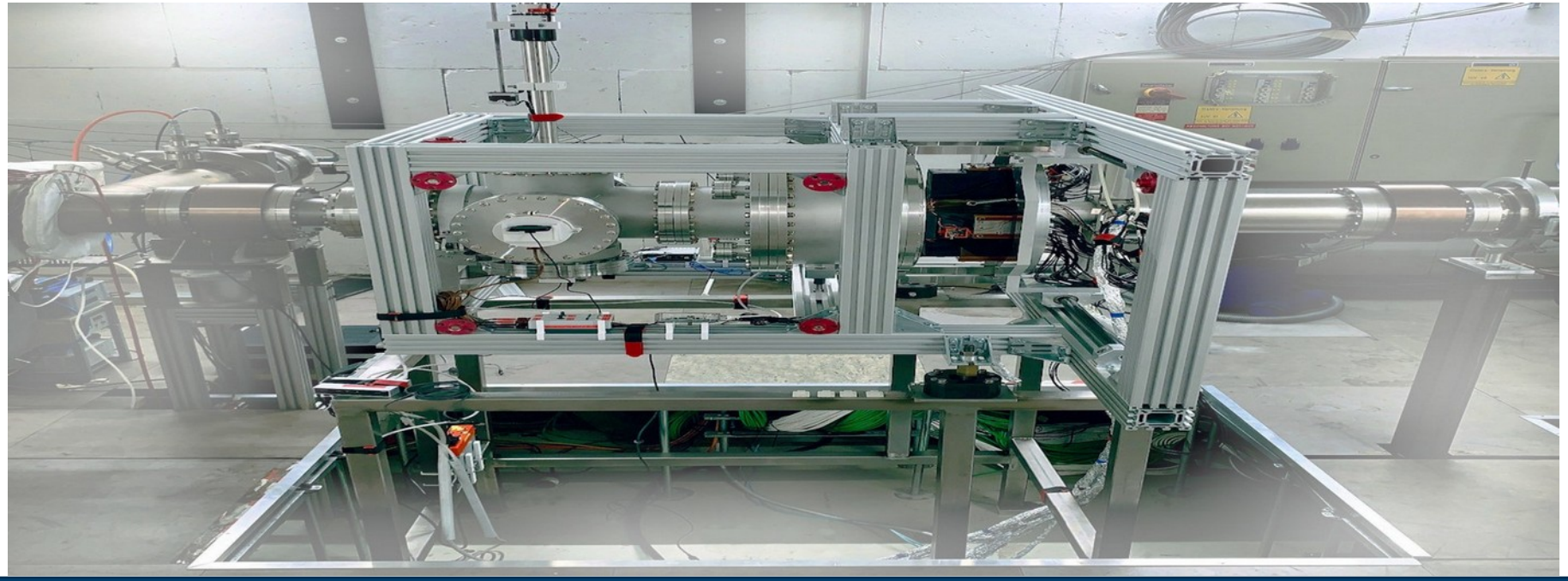


COMPLEX COMMISSIONING OF JEPO

Speaker: I. Keshelashvili

CBAC 2020 #12 | Exp. No.: E002.8

2020.10.08

JÜLICH
Forschungszentrum

OUTLINE

- *JEDI Polarimeter **(JePo)** installation*
- *Beam times [October 2019, January 2020 and **September 2020**]*
- *Target installation*
- *Tracking system installation*
- *DAQ hardware and software upgrade*
- ***Summary***

PAST COMMISSIONING

October 2019, February 2020

2019 – Vertical polarization

	October					November				December			
Week	40	41	42	43	44	45	46	47	48	49	50	51	52
	30/09/19	07/10/19	14/10/19	21/10/19	28/10/19	04/11/19	11/11/19	18/11/19	25/11/19	02/12/19	09/12/19	16/12/19	23/12/19
Monday	Beam based alignment	Beam based alignment (A015.1)	MD	JEDI Polar. (E002.7)	MD	CBM (D004.7)	MD	stochastic cooling (A001.9)	electron cooling (A002.6)	PANDA Koala (D005.3)	Maintenance / Radiation hardness (D012)	Maintenance	Maintenance
Tuesday													
Wednesday													
Thursday	Feiertag				Feiertag								
Friday	(A015.1)												
Saturday													
Sunday													
	unpol.deuterons		pol. deuterons		unpolarized protons								
	COSY internal beam				JESSICA		COSY internal beam				Cyc. BIG Karl		

2020 – Horizontal spin recession

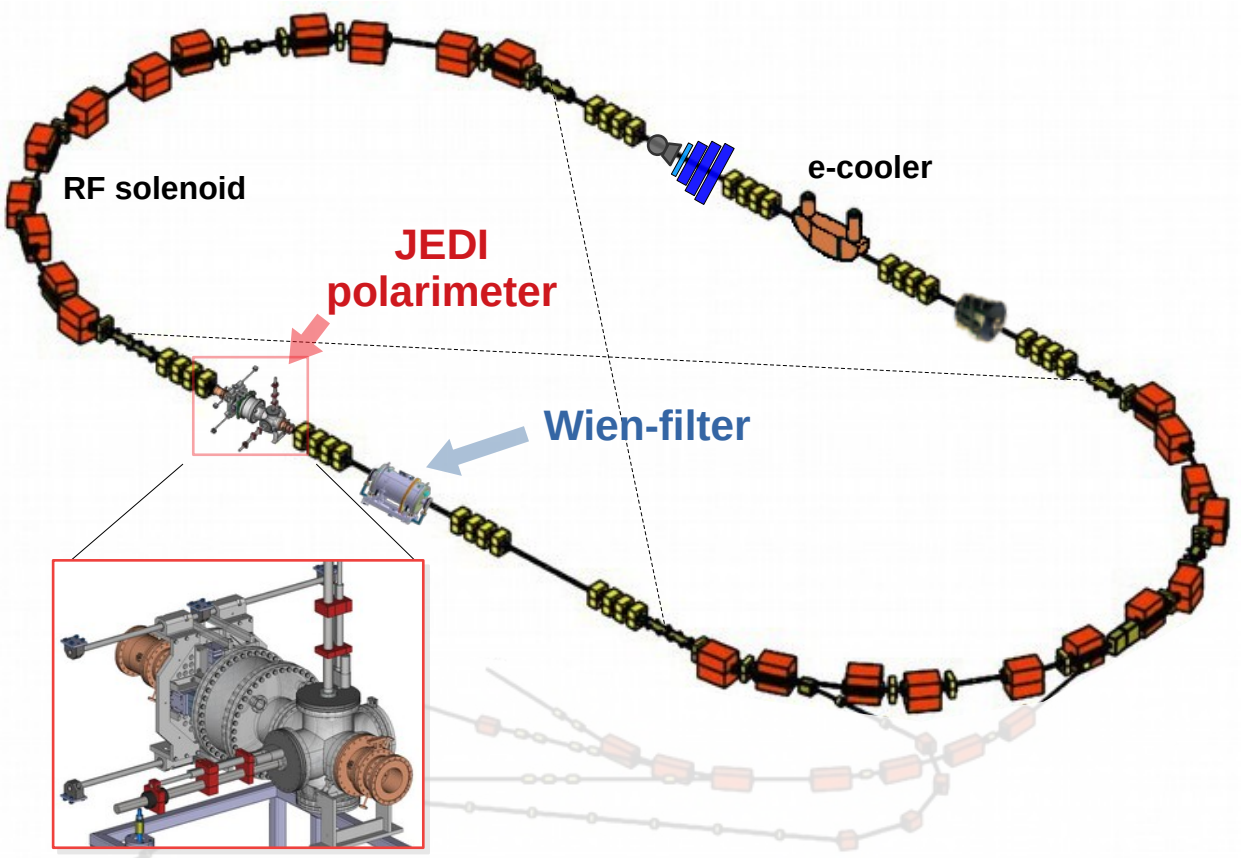
beam time schedule 2020, 1st half

	January 2020						February		March				
Week	1	2	3	4	5	6	7	8	9	10	11	12	13
	30/12/19	06/01/20	13/01/20	20/01/20	27/01/20	03/02/20	10/02/20	17/02/20	24/02/20	02/03/20	09/03/20	16/03/20	23/03/20
Monday	Maintenance	Maintenance	Maintenance / HBS (A10.6)	MD	JEDI Wien Filter (E05.6)	CBAC-11	MD	Lumi-Det. (D011.1)	Karneval	MD	Siberian Snake (A009)		Maintenance
Tuesday						JEDI Polar. (E002.7)			JUSPARC (A016)				
Wednesday													
Thursday													
Friday													
Saturday													
Sunday													
			unpol. Deuterons	polarized deuterons			unpol. protons		polarized protons				
			Cyc. - Big	COSY internal			JESSICA		Cyc. Big Karl	COSY internal			

September 2020 finished recently...

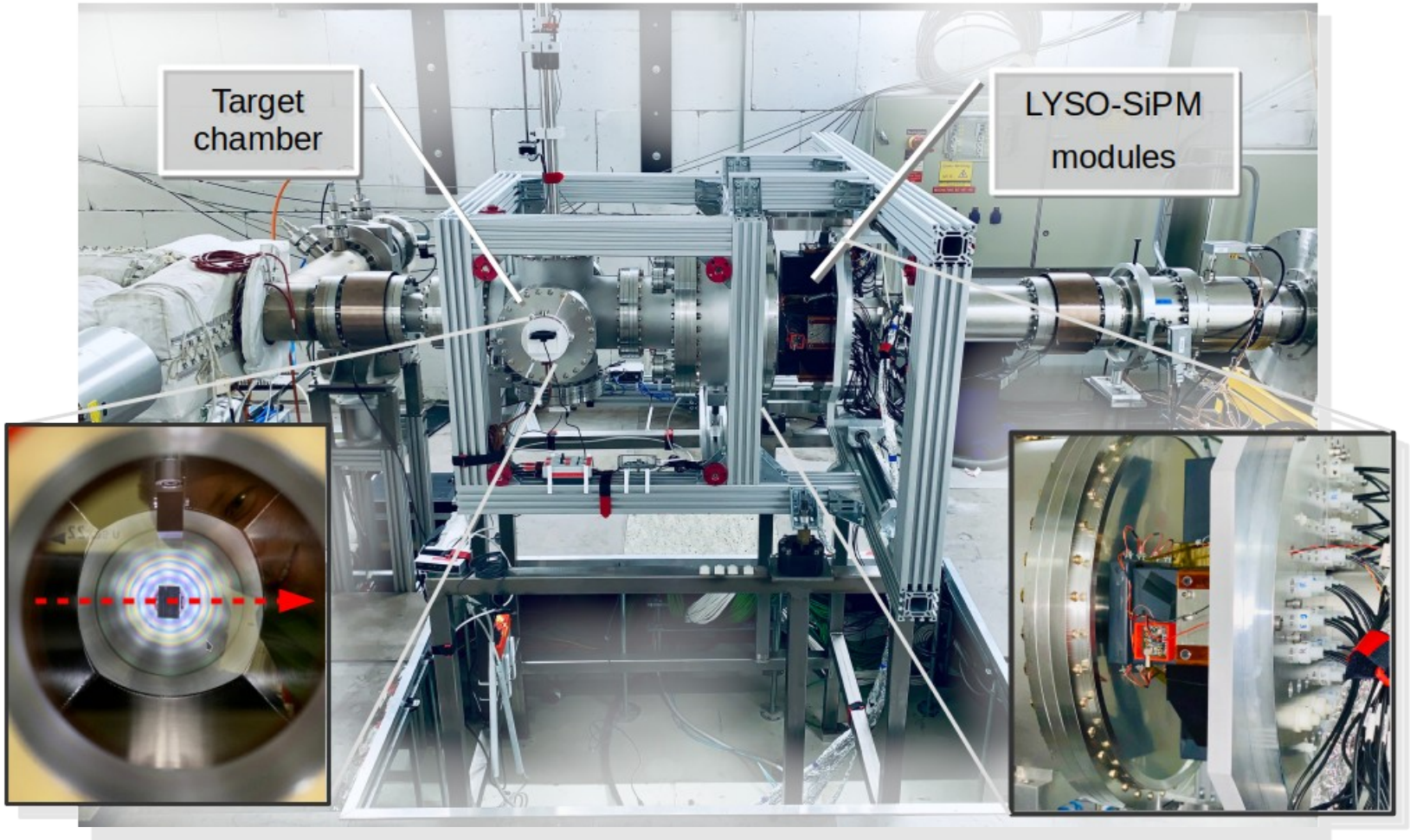
JEDI POLARIMETER @ COSY

Summer 2019



INSTALLATION @ COSY

Summer 2019



A New Beam Polarimeter at COSY to Search for Electric Dipole Moments of Charged Particles

JEDI collaboration

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[13] *Zentralinstitut für Engineering, Elektronik und Analytik, Forschungszentrum Jülich, 52425 Jülich, Germany*
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[16] *Dubna State University, 141980 Dubna, Russia*
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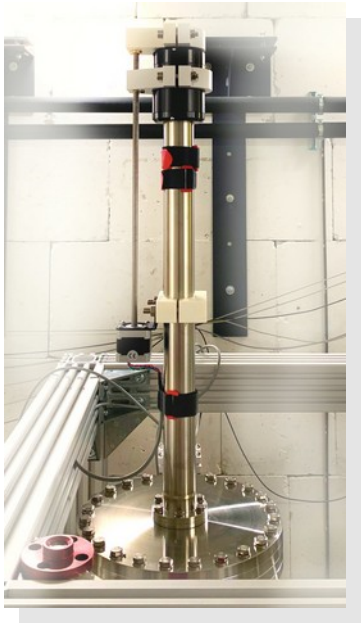
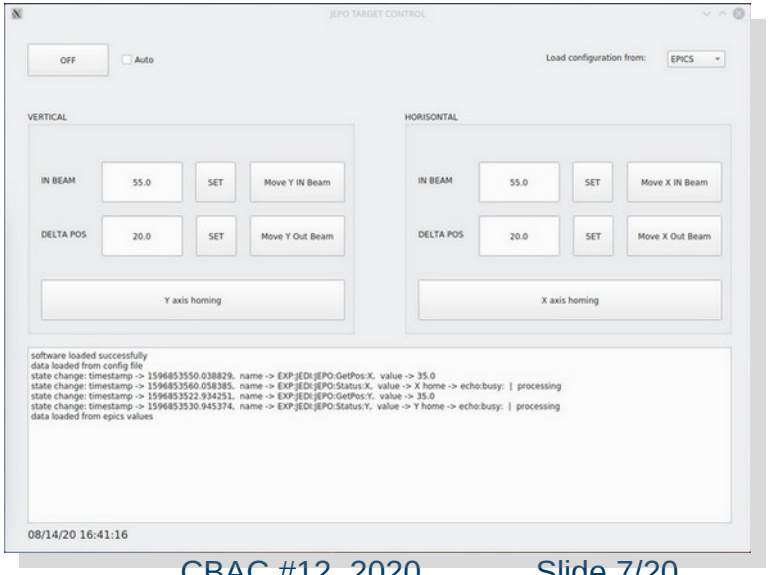
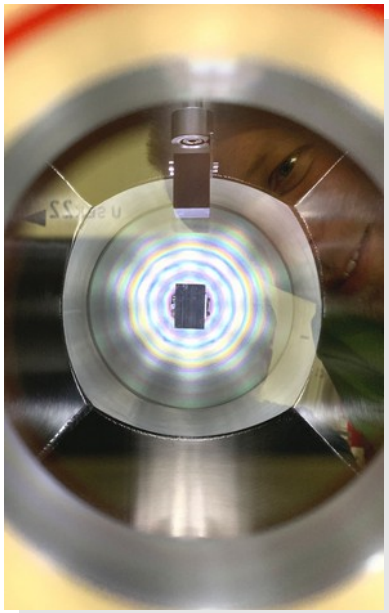
CURRENT TARGET @ JEPO

2 cm graphite (carbon) vertical and horizontal blocks

- Fully automatized system
- Integrated into COSY EPICS
- Flexible for quick modifications
- UHV fully isolated
- ...

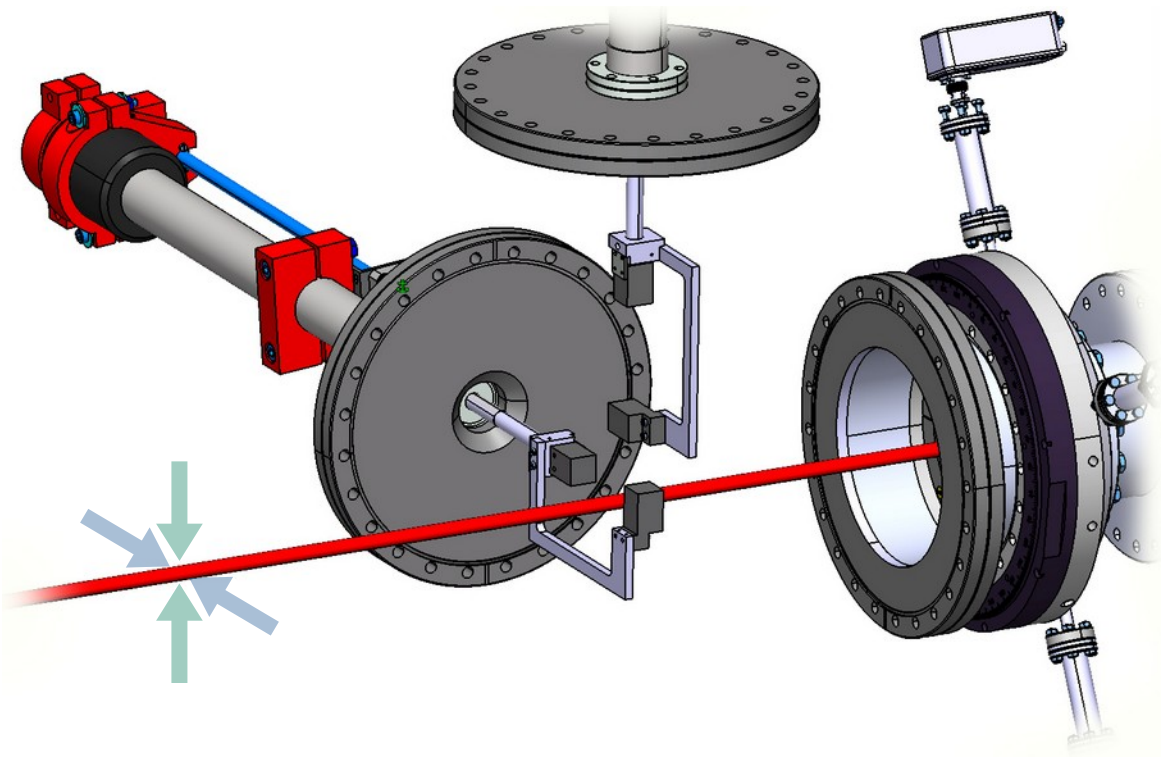






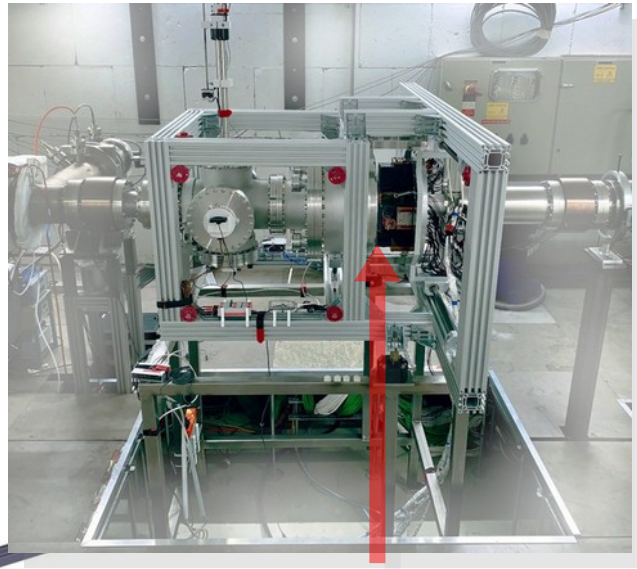
NEW TARGET SYSTEM

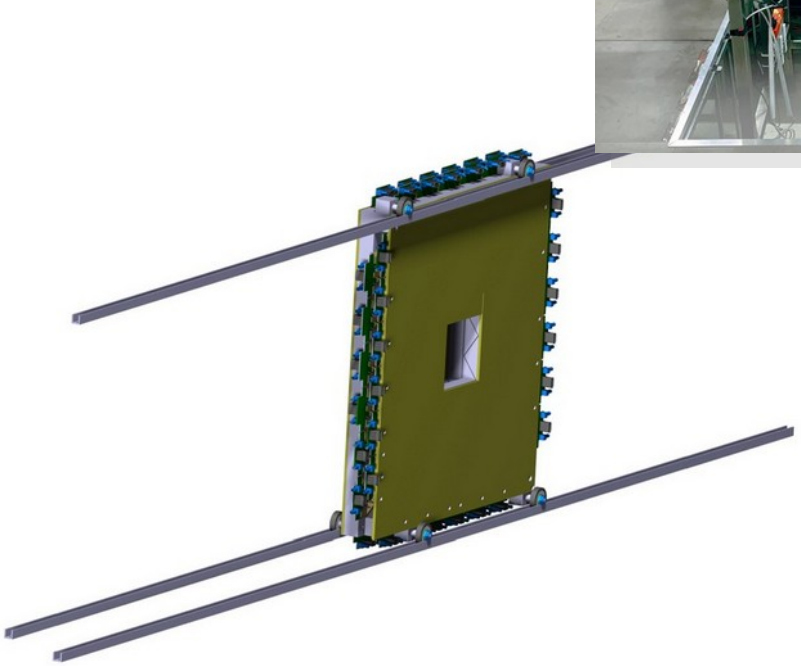
Will approach beam from all sides [up, down, left, right]

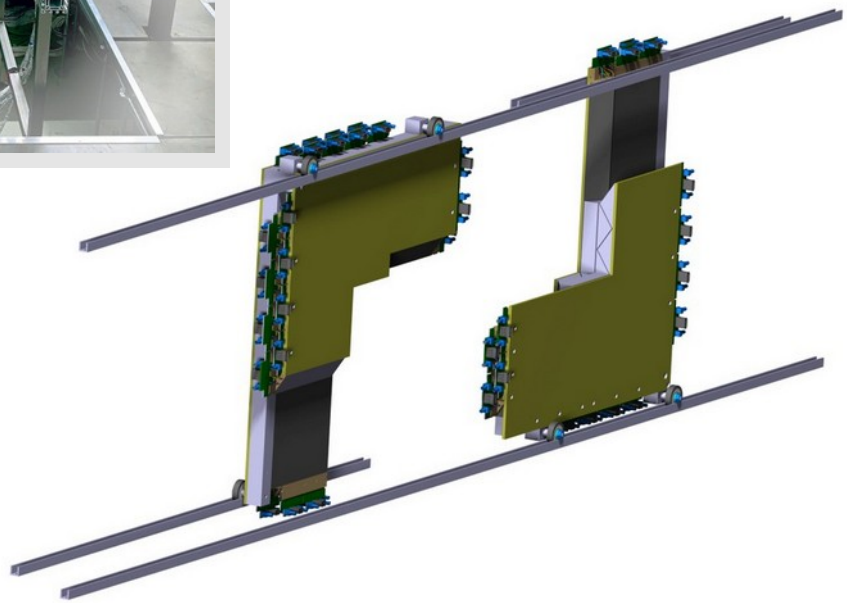


TRACKING + DELTA E

Improved position resolution [angular resolution]

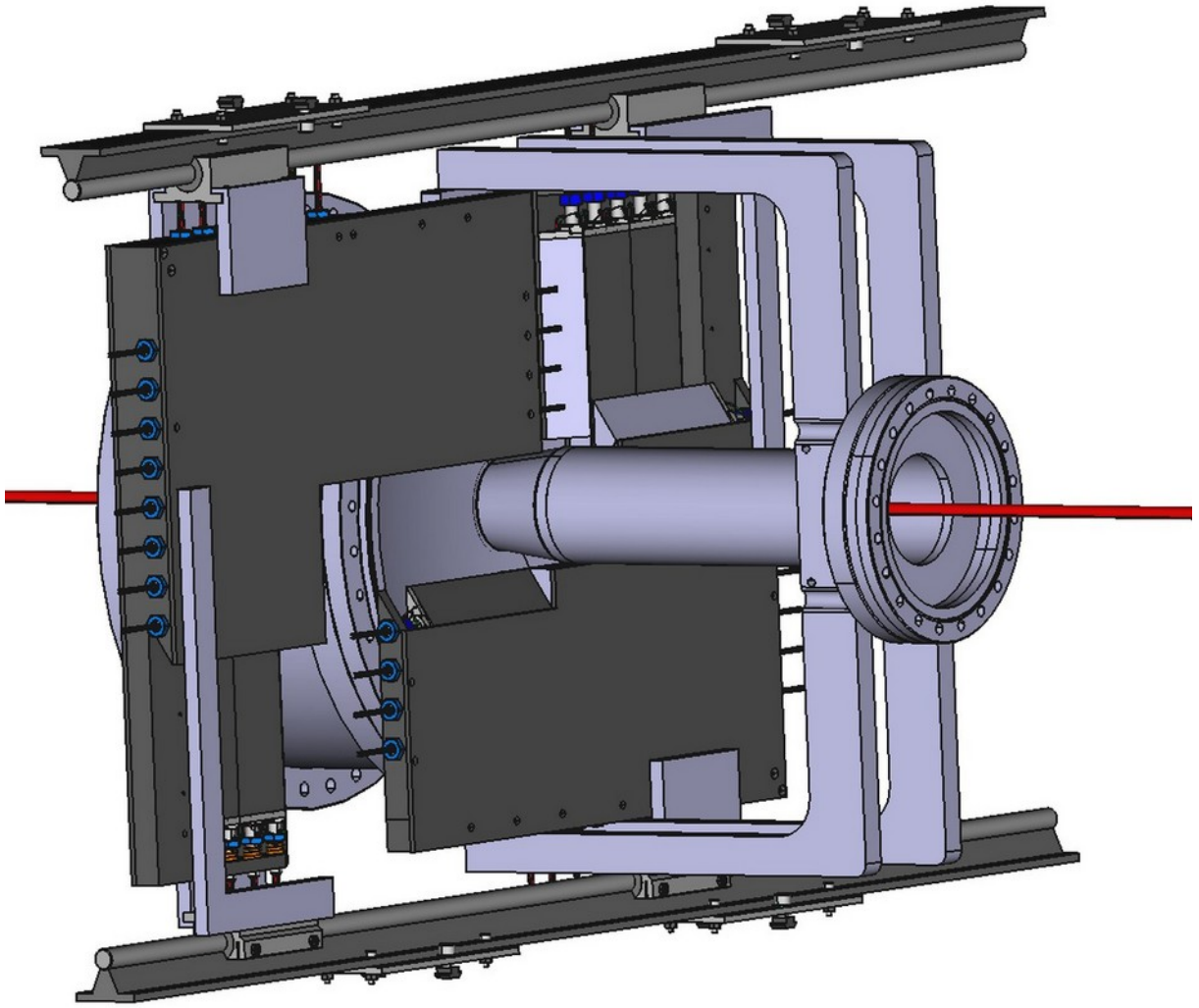




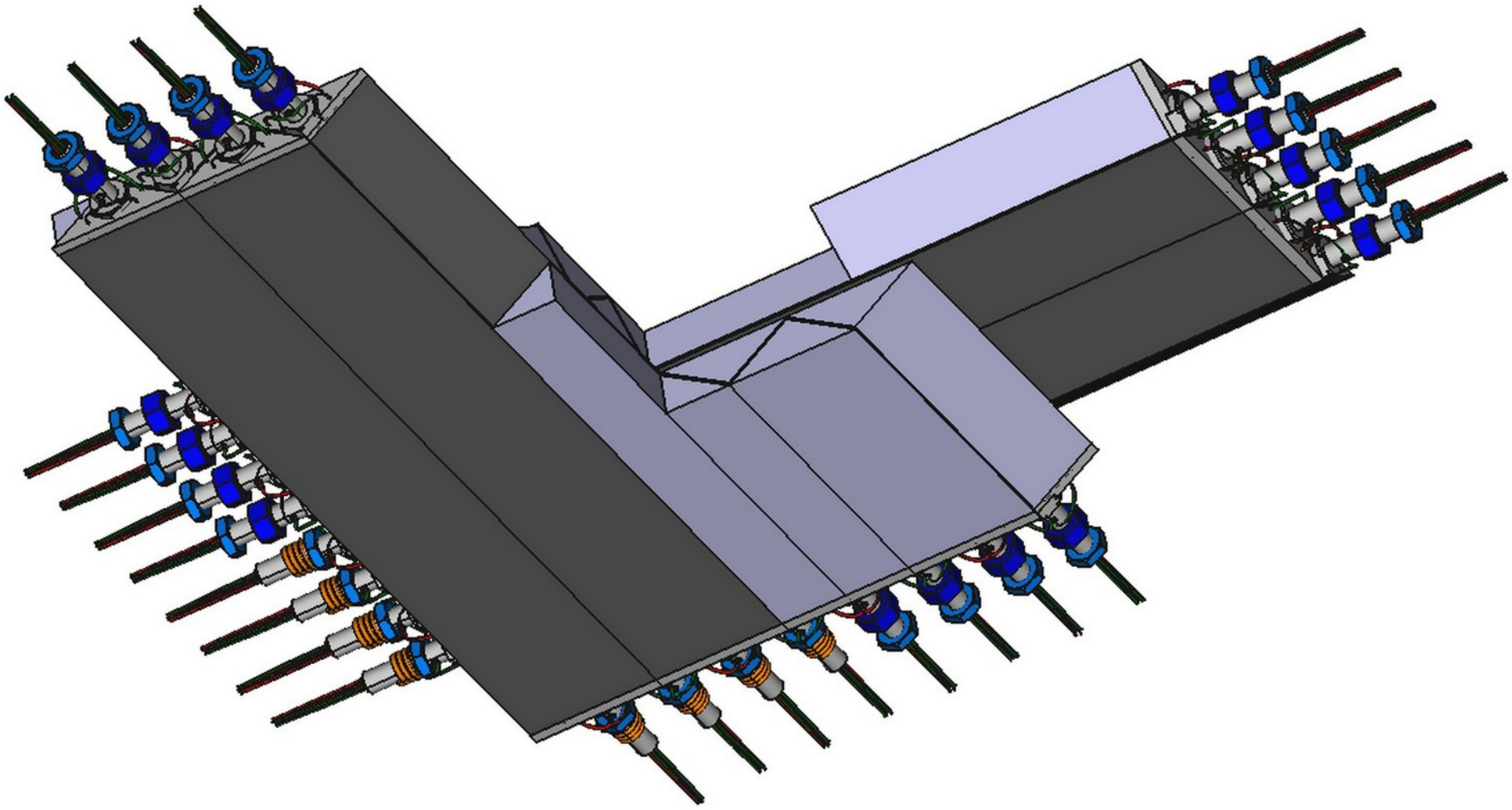


JÜLICH Forschungszentrum

TRACKING + DELTA E

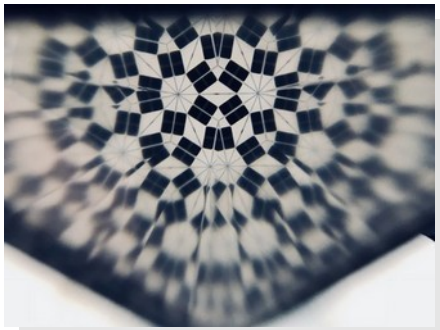


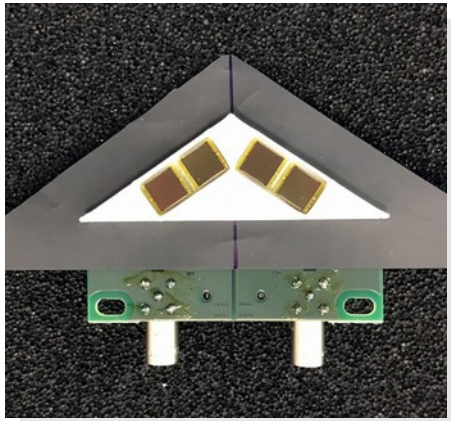
TRACKING + DELTA E

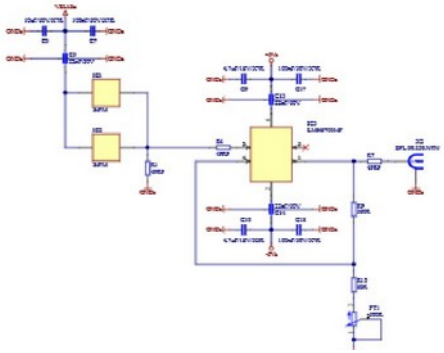


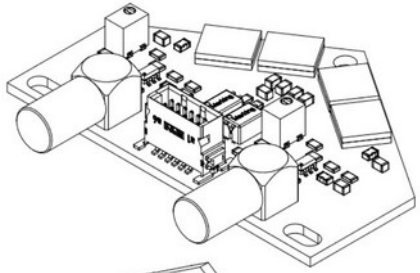
TRACKING SYSTEM

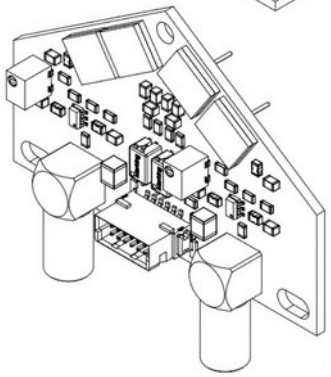
Already existing and tested system

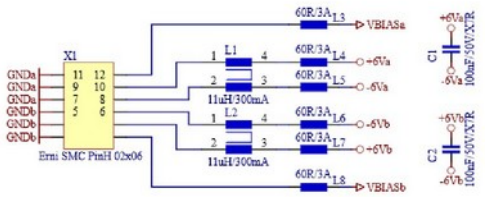


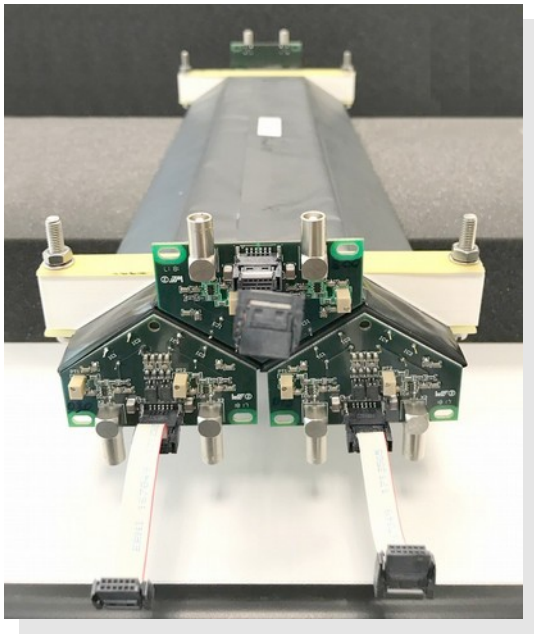






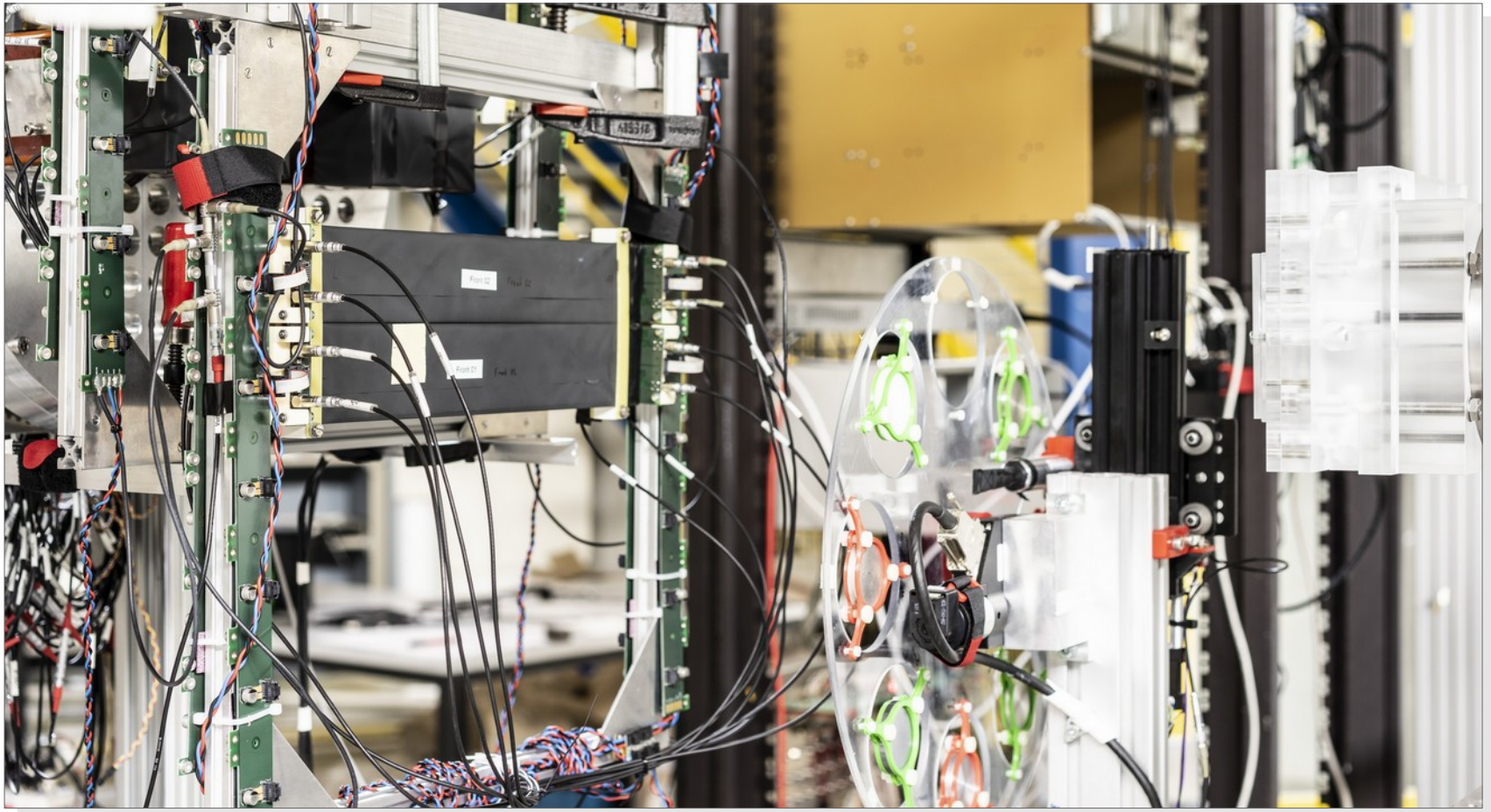






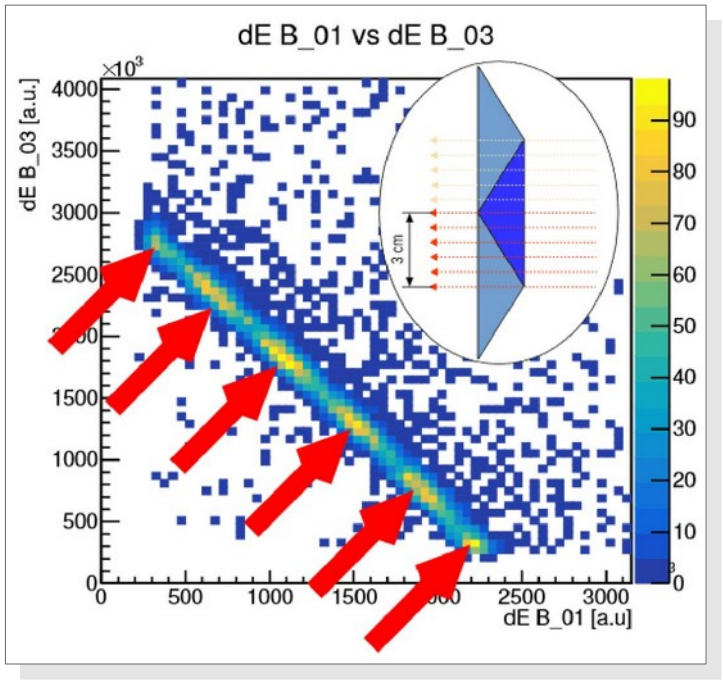
TEST OF TRACKING SYSTEM

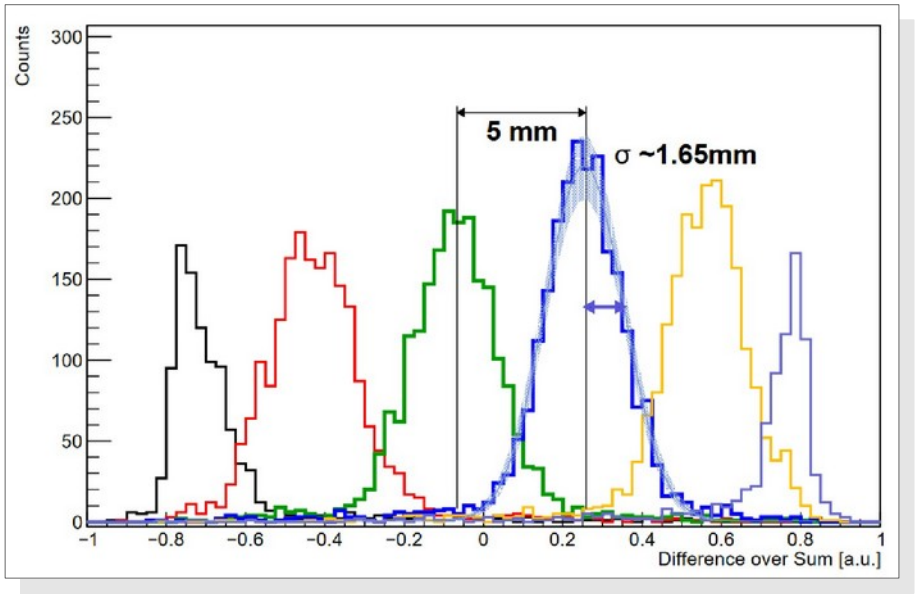
Beam time 2018



TRACKING SYSTEM

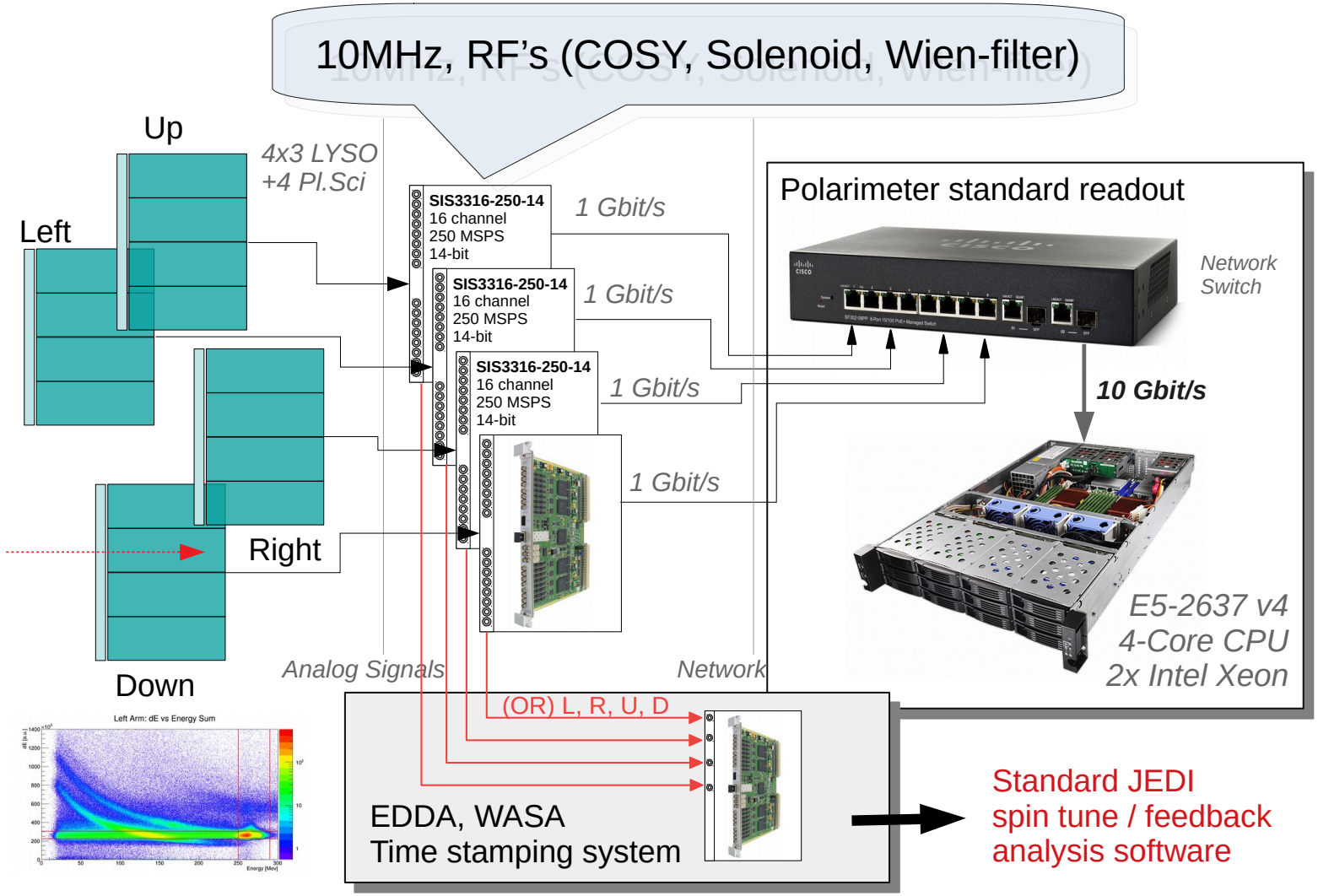
Position resolution <2mm





ONLINE FEED-BACK SYSTEM

Mostly software modification are required



SUMMARY

- ***JePo** installed in the ring summer 2019*
- *Beam times [October 2019, January 2020, **September 2020**]*
  - *First commissioning; vertical polarization measurement*
  - *In-plane polarization → First flip*
  - ***2 and 4 banches manipulated by RF-Wien filter***
- *Coming installations [December 2020]*
  - *Target modification → All sides*
  - *Installing the tracking system*
  - *Feed-back online analysis*
- ***Long polarimeter publication submitted in JINST***

Beam request

Combine the beam time for this proposal (E 002.8) with the beam time requested for the 2nd precursor run (E 005.7).

In order to make efficient use of the available beam time and man power — given the overhead for setting up the experimental environment —

we ask for 3 (1 MD + 2 EXP) weeks

(one week of machine development followed by two weeks of measurement time)

in the first quarter of 2021

using cooled polarized deuterons at a kinetic energy of Td = 230 MeV.

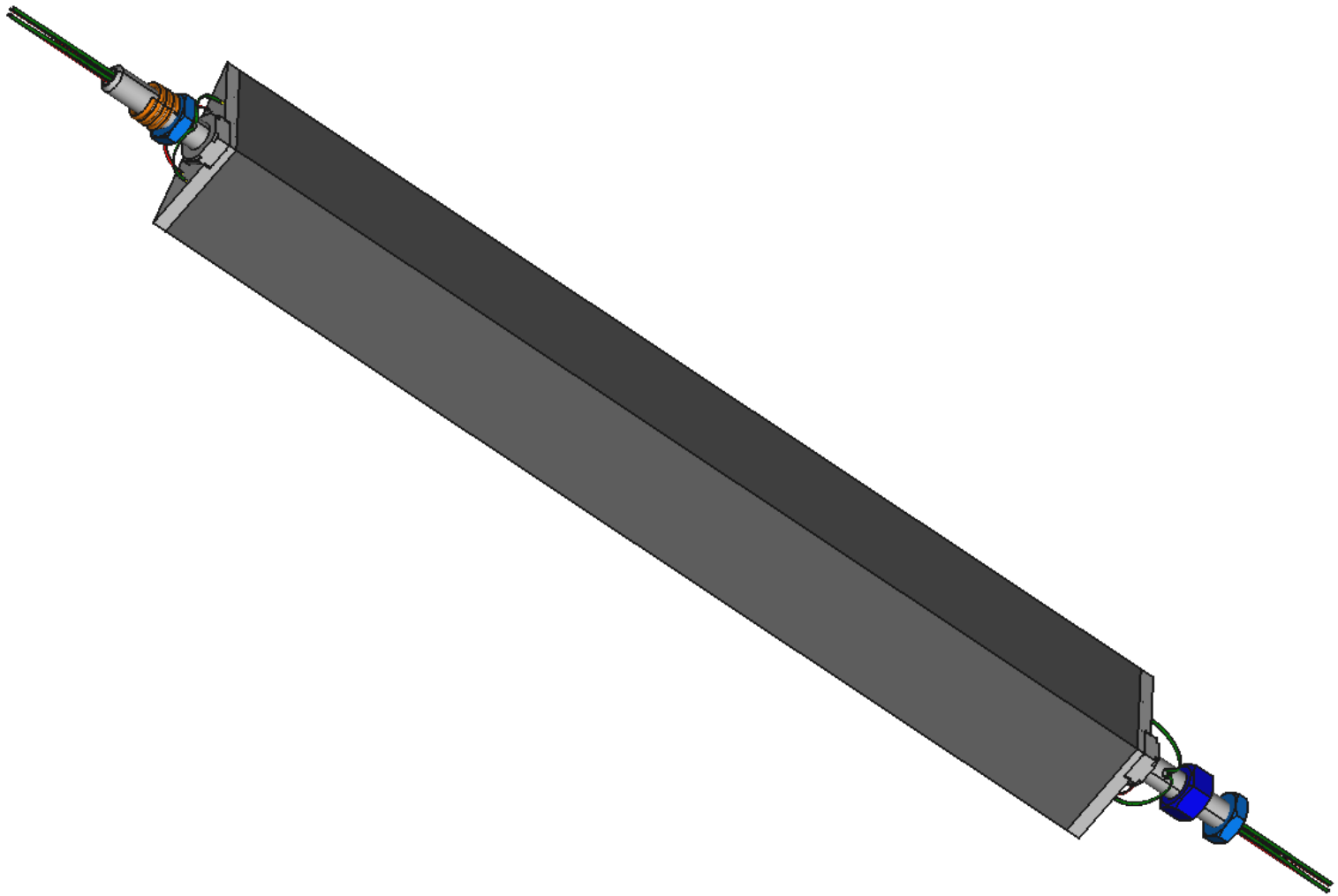
AKNOWLEDGEMENT

Shota Rustaveli National Science Foundation of Georgia

(SRNSFG grant number DI-18-298),

”High-precision polarimetry for charged-particle Electric Dipole Moment (EDM) searches in storage rings”

TRACKING + DELTA E



TRACKING + DELTA E