

# TA1 - Transnational Access to COSY

Dieter Grzonka , Nuclear Physics Institute, Forschungszentrum Jülich

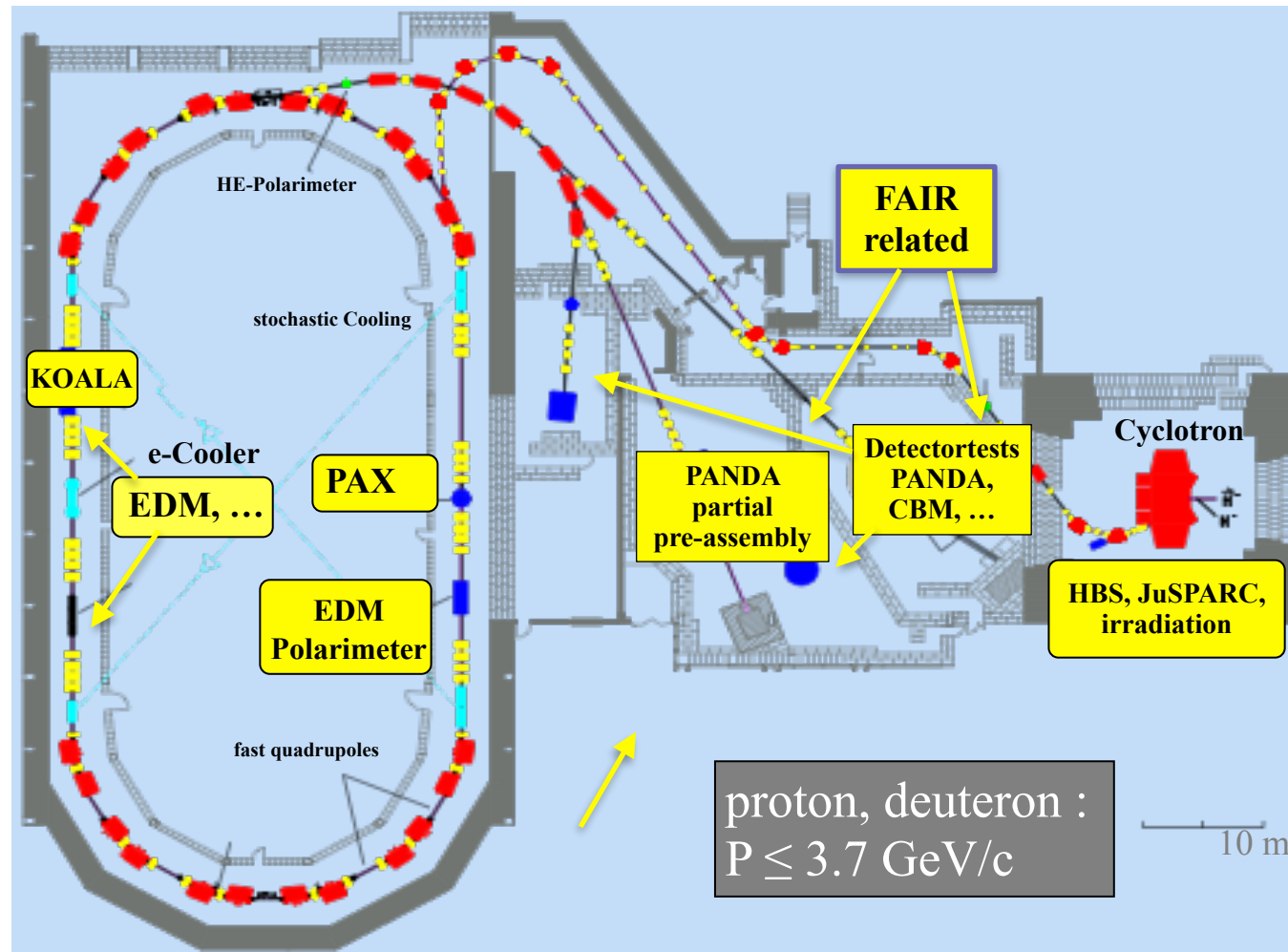
- COSY
- Deliverables
- Projects
- Summery

*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824093*





# TA1 - Transnational Access to COSY



Cyclotron < 300 MeV/c

Cooler-Synchrotron COSY < 3.7 GeV/c

$5 \cdot 10^{10}$  stored p,d unpolarized, polarized

phase space cooling

internal, external target stations

## TA1 - Transnational Access to COSY

Transnational Access Provision - beam hours (unit cost 90 €/hour)  
Travel support for user

<b>Deliverables</b>	<b>first 18 months</b>	<b>second 18 months</b>	<b>whole project</b>
<b>Min. quantity of access to be provided</b>	<b>600</b>	<b>600</b>	<b>1600</b>
<b>Estimated number of users</b>	<b>42</b>	<b>42</b>	<b>112</b>
<b>Estimated number of user days</b>	<b>252</b>	<b>252</b>	<b>672</b>
<b>Estimated number of projects</b>	<b>12</b>	<b>12</b>	<b>32</b>

## TA1 - Transnational Access to COSY

Transnational Access Provision - beam hours (unit cost 90€/hour)  
Travel support for user

<b>Deliverables</b>	<b>first 18 months</b>	<b>achieved</b>
<b>Min. quantity of access to be provided</b>	<b>600</b>	<b>648</b>
<b>Estimated number of users</b>	<b>42</b>	<b>36</b>
<b>Estimated number of user days</b>	<b>252</b>	<b>726</b>
<b>Estimated number of projects</b>	<b>12</b>	<b>4 (→ 8 USP 10/2020)</b>

<http://www.ikp.fz-juelich.de/strong2020/>



User prepares **research proposal**  
or request for test beam  
(at existing facilities or new equipment)

call for proposals  
e-mail to potential users  
dedicated website

scientific coordinator  
at COSY

**user selection panel**  
(experts independent from COSY and FZJ)  
evaluates proposal on scientific grounds,  
recommends EU supported access

priority rules  
given by EU

**free access to COSY**  
and its experimental installation,  
reimbursement of travel, subsistence costs

## CBAC (user selection panel)

<b>Aulenbacher, Kurt</b>	Univ. Mainz, DE
<b>Kester, Oliver</b>	TRIUMF, CA
<b>Schmidt, Christian Joachim</b>	GSI, DE
<b>Stöhlker, Thomas</b>	GSI, DE
<b>Weber, Marc (Chairperson)</b>	KIT, DE

Meeting: twice per year  
1/2 July 2019, 3/4 February 2020  
8/9 October 2020

## Projects selected for EU support

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- **Beam-based alignment**
- **Towards EDM Polarimetry:  
Commissioning of the internal polarimeter  
based on LYSO crystals at COSY**
- **Measurement and Optimization of the  
Spin Coherence Time for Protons in  
COSY**
- **Ay measurement of elastic pp-scattering  
in the CNI region**

## Further activities at COSY

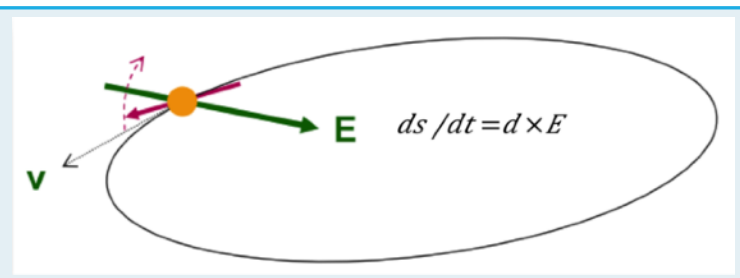
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- Accelerator development  
stochastic cooling, electron cooling,  
orbit control studies, component test
- Detector tests  
CBM, HADES, PANDA, KOALA
- Neutron research developments  
HBS, moderator studies, n-production
- JUSPARC
- Irradiation studies



## Main activities: EDM (electric dipole moment) measurement

principle: horizontal polarized beam ; electric field  $\rightarrow$  buildup of vert. pol.



## Beam-based alignment

Measurements of electric dipole moments (EDM) in storage rings requires extreme precision in all tools.

$\Rightarrow$  optimized orbit (center of quadrupoles)

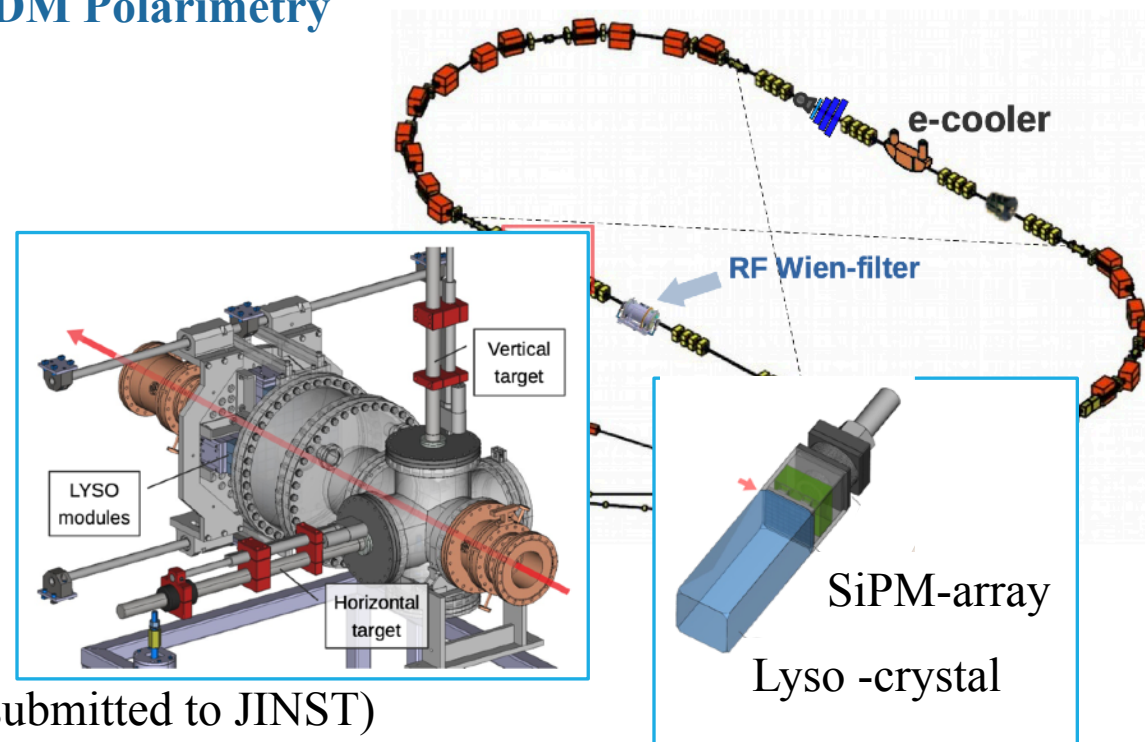
orbit correction base on BPM measurement

$\Rightarrow$  BPM calibration via beam-based alignment (orbit change vs quadrupole strength)

$\Rightarrow$  improvement of orbit

(submitted to JINST)

## EDM Polarimetry



(submitted to JINST)

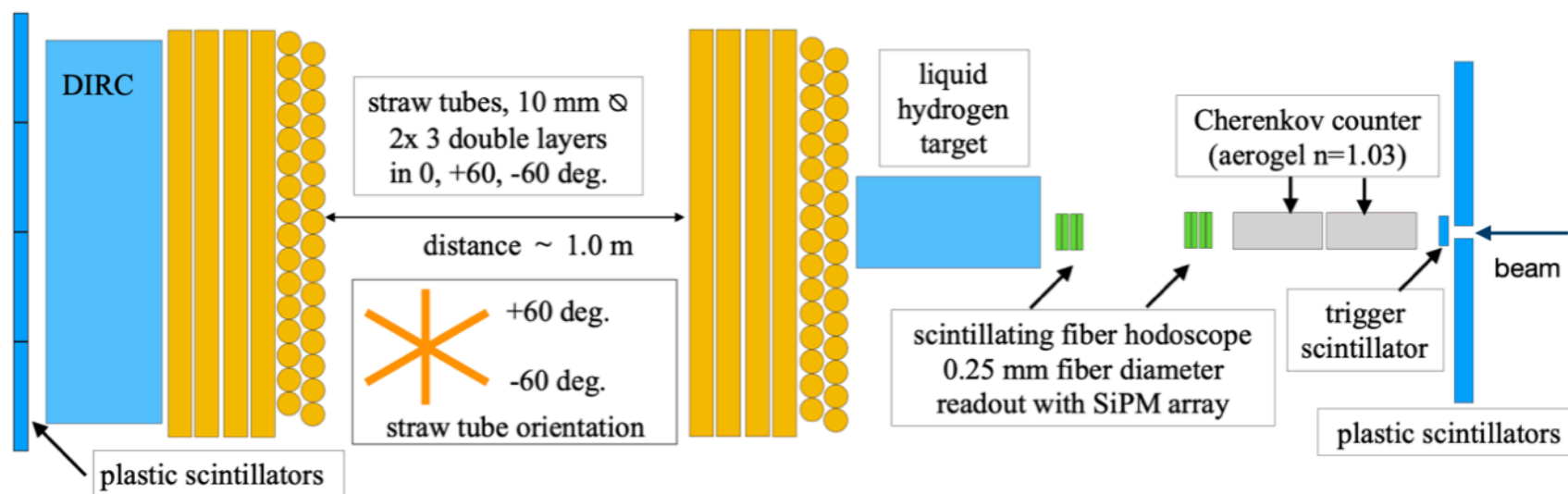
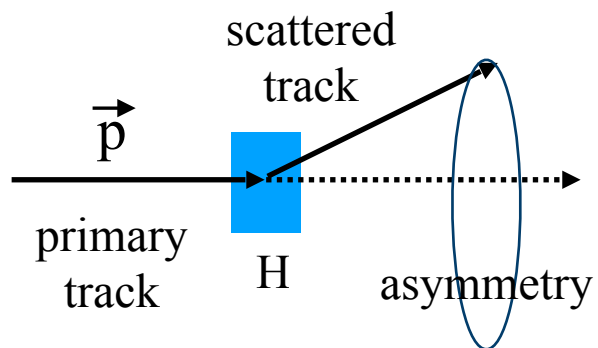
## Measurement and Optimization of the Spin Coherence Time for Protons in COSY

EDM measurements base on spin rotation  
due to electric field  
⇒ long spin coherence time (SCT)

deuteron: SCT > 1000 s achieved

proton: more difficult  
(larger magnetic moment, more spin resonances)

### Ay measurement of elastic pp-scattering in the CNI region





## TA1 - Transnational Access to COSY

### Summary

- Deliverables mostly achieved
- Number of users and projects reduced due to corona  
(will be compensated in the coming periods)
- COSY will be in operation until end of 2024  
⇒ whole duration of the project covered