

# Target polarimetry for LHCspin

Breit Rabi polarimeter and Target gas analyser

To-do list

2024-02-15 LHCspin Meeting

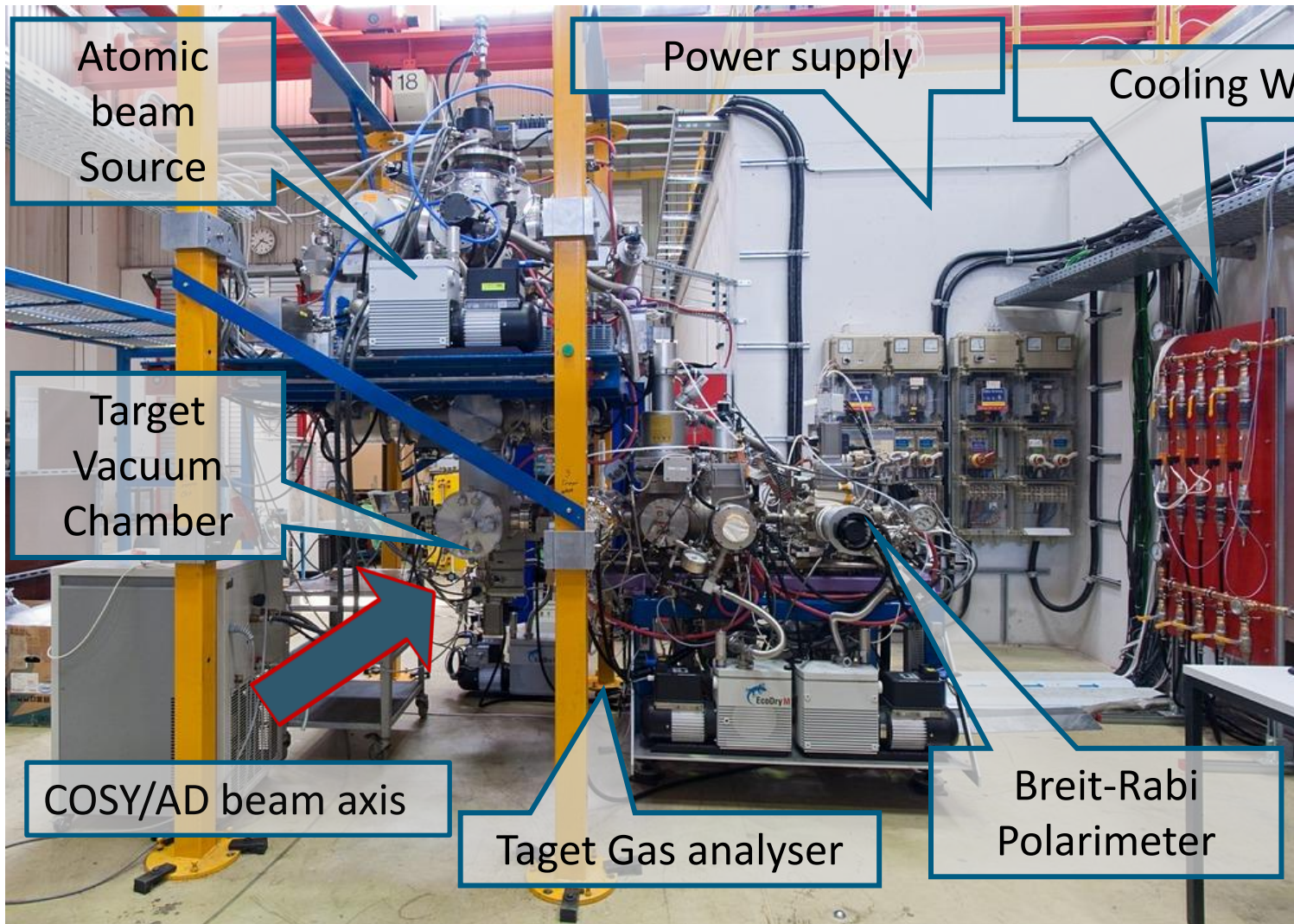
## **Achievements:**

From the Pasquale email on 7 february 2024

Develop a concept of BRP compatible with the IR4  
tunnel dimensions

Vacuum chamber discussion with the ABS BRP  
LHC vacuum separation valve

Target : ABS, openable cell e BRP working for test and calibration



## Breit-Rabi Polarimeter Working Group (BRP-WG):

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Tarek El Kordy	FZJ - Jülich	.....

The BRP WG group is strongly connected to the pABS working group, cross information to be distributed.

## Polarized Atomic Beam Source Working Group:

IN BRP	First and Last name	Affiliation	e-mail
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NO	Norbert Koch	FZJ - Jülich	.....
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V	Tarek El Kordy	FZJ - Jülich	.....

# WG organization

- **Data Storage for the Working group:**
- Organize a Drive where to share documentation and works in progress.
  
- **Operational Documentation as starting points:**
- Logbook of HERMES Breit-Rabi at DESY and PAX-Breit-Rabi Modified at COSY
- Baumgarten PhD and Diploma Thesis (HERMES operation)
- Davide Reggiani PhD Thesis (HERMES operation)
- Colin Barschel PhD Thesis (PAX operation)

## Publications

- C. Baumgarten et al. *An atomic beam polarimeter to measure the nuclear polarization in the HERMES gaseous polarized hydrogen and deuterium target* NIMA **482** (2002) 606-618.
- C. Baumgarten et al. *A gas analyzer for the internal polarized target of the HERMES experiment* NIMA **508** (2003) 268-275.
- A. Arapetian et al *The HERMES polarized hydrogen and deuterium gas target in the HERA electron storage ring* NIM **540** (2005) 68-101.
- A. Nass et al. *The HERMES polarized atomic beam source* NIMA **505** (2003) 633-644.
- Barschel C. et al *Target Section for spin filtering studies at COSY and CERN/AD in the 13<sup>th</sup> International Workshop on Polarized Sources and Targets and Polarimetry – 7-11 September 2009 Ferrara.*

# Brainstorming

- **Brainstorming for Breit-Rabi at LHC-spin**
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- **Free Beam or accumulation in a Cell**
  - The working group should work on both possibilities?
  - ...
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- **Geometry and available space**
- The working group should work on both possibilities?
  - ...
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- **Simulation of beam tracking (tracing):**
- Who can take in hands?
- Michelle Stancari simulated the new optics for the Breit-Rabi at COSY, software in our hands, but to be brought in operation.
- Tom Wise
- Alexander Nass
- Frank Rathman
- J.L. Martinez-Marin, B. Mustapha, W. Armstrong, Argonne National Laboratory, Lemont, IL, USA **Pytomic: A Python Tool for Polarized Atomic Beam Tracking**
  - Poster presented at IPAC 21 –
  -
- **Sextupole Magnets**
  - ...
  - ...

No cooling pipe in vacuum, the support of the homogeneous field is cooled by water in air.  
more space required.

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- **Starting from the present Breit-Rabi Polarimeter at COSY.**

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## **Slow Control**

- **In hand the slow control already in use at COSY**

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## **Calibration and measuring software**

- **In hand The calibration and measuring software strictly connected to the injection state of the ABS.**

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- **Integration in the CERN software.**

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