



Central Technology Division ZAT

28. April 2009 Günter Hansen

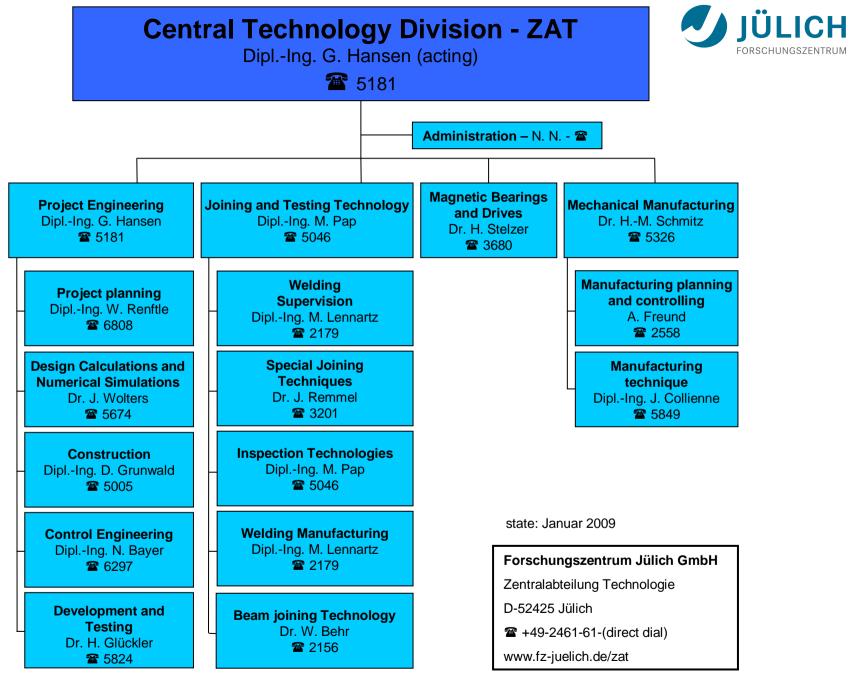


Central Technology Division

The main task of the Central Technology Division (ZAT) is to support the research departments and projects of the research Centre Jülich by supplying instruments, installations and processes not available in the market.

Apart from projects for complete installation ZAT also takes over tasks like engineering, calculation, design, machining, testing and joining technology.

To be able to accomplish these tasks ZAT pursues a continuous development of instruments, components, processes and technologies. Using this competence ZAT participates in a number of research activities and realises its own scientific contribution.

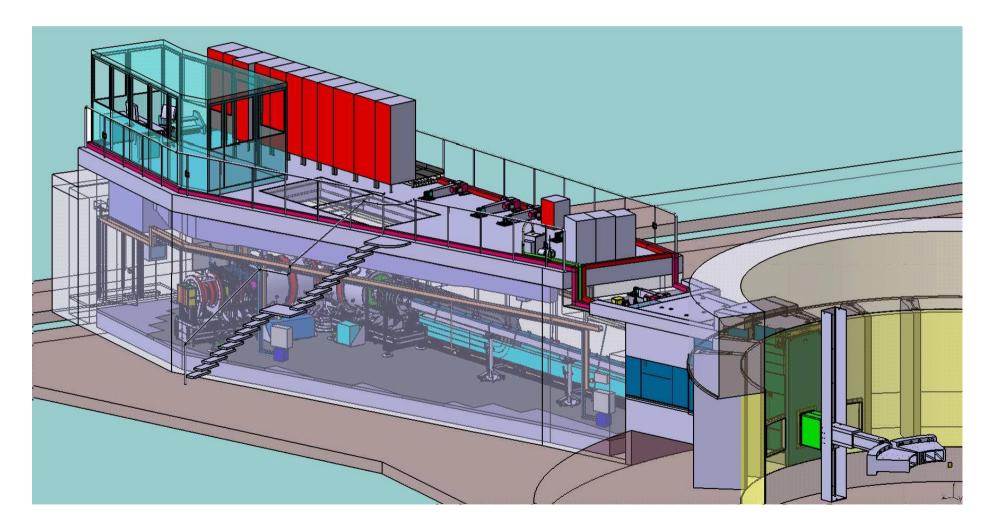


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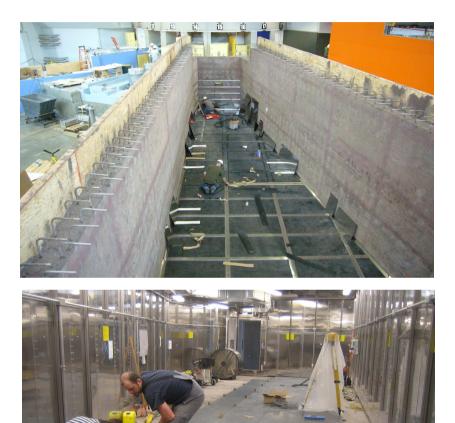


Neutron Spin Echo Spectrometer for SNS in Oak Ridge

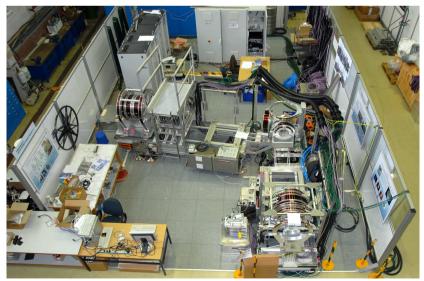




NSE for SNS





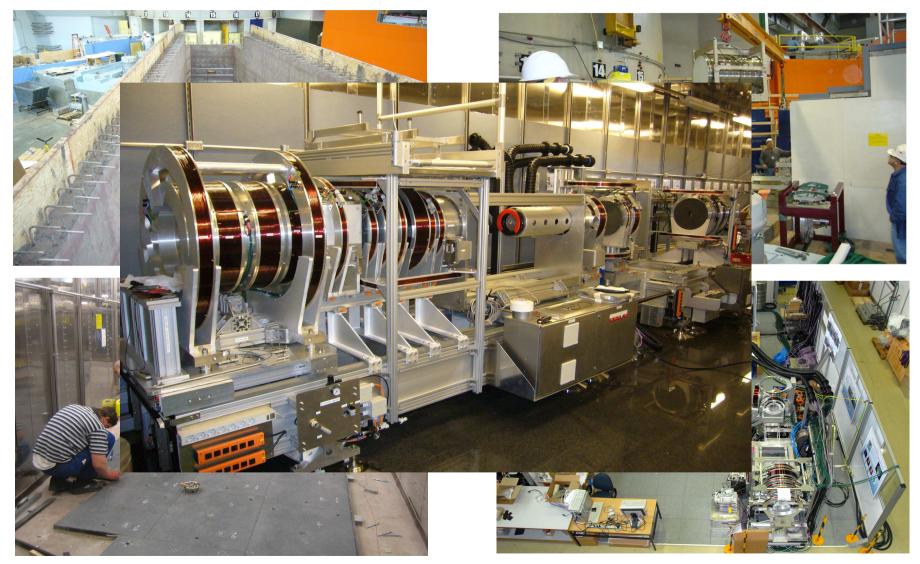


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NSE for SNS

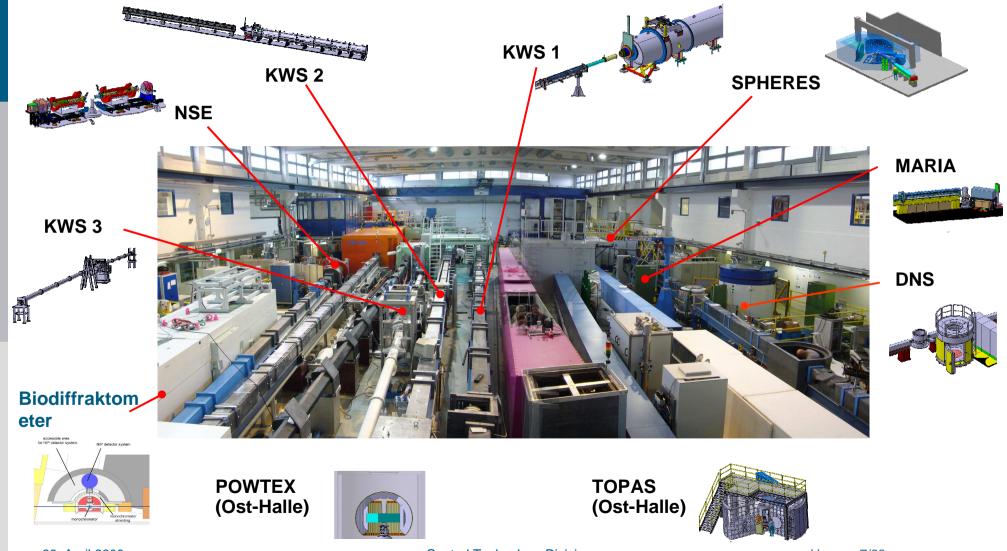


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ZAT-Projects at the research reactor Munich



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High-Performance Chopper Systems for Neutron, Light, and X-Ray Sources

Permanent magnetic bearings (PMB) are well established for high-speed chopper applications. The bearing– motor unit became largely standardized and a base for operation of various chopper rotors at different speed ranges.

Double Disk Chopper

NIST-NG3, SANS 2 disks

6.5 kg; 18.000 rpm

The Jülich bearing- motor system is characterized by:

- · drive with nanosecond phase stability
- self- centering of the rotor by permanent magnet induced restoring forces
- minimum electronics for stabilization control.
- · low power consumption of the bearing, independent of the rotor mass
- friction-less, high-speed chopper operation in vacuum
- safe operation in ceramic back-up bearings
- maintainance free

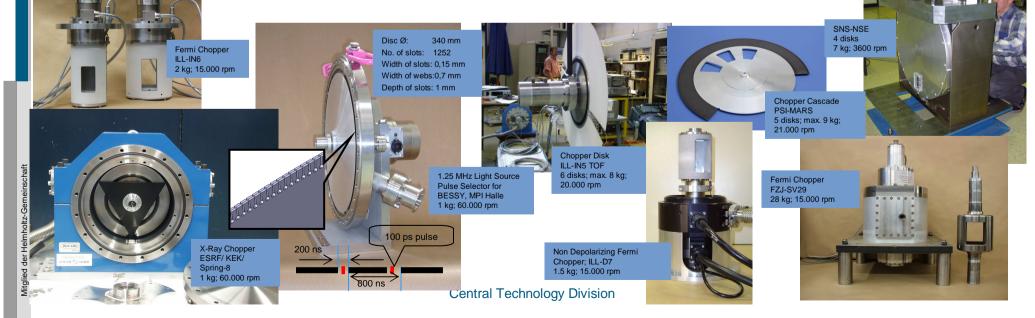
Chopper Cascade

6 disks; max. 8 kg; 20.000 rpm

ILL-IN5 TOF

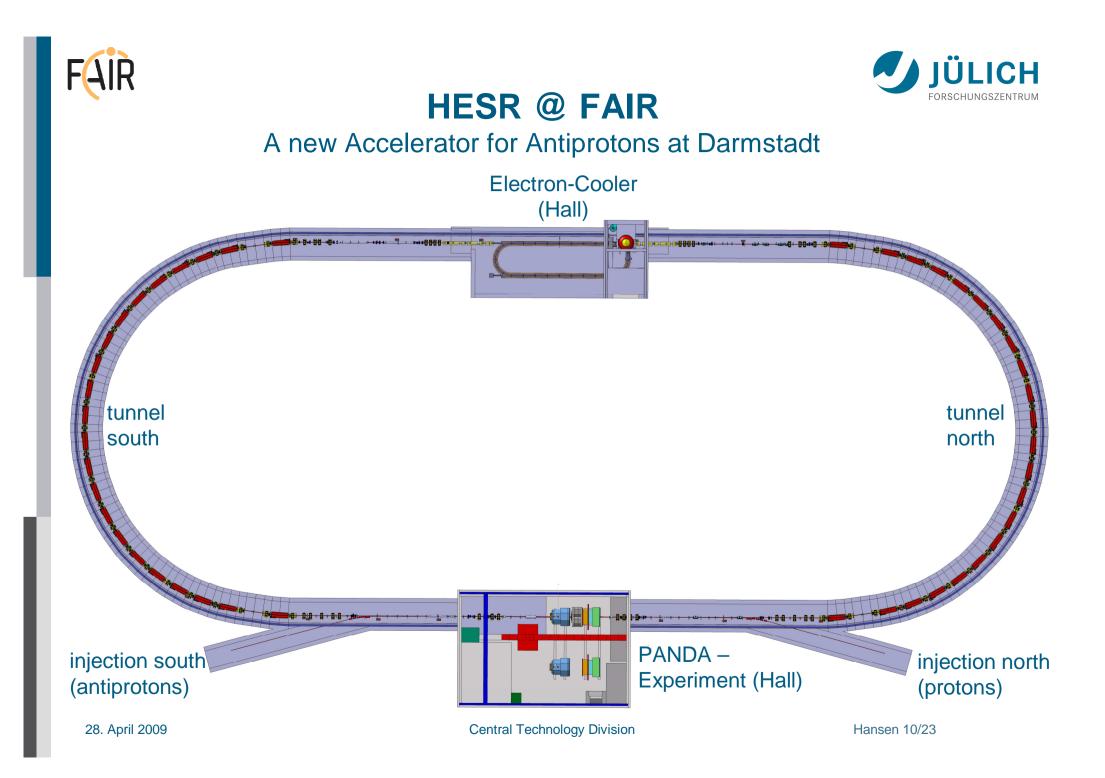
• no forced cooling at room temperature

This gives the advantage of inherent simplicity, reliability, and safety



Facility for Antiproton and Ion Research (FAIR)









HESR @ FAIR

A new Accelerator for Antiprotons at Darmstadt

Basic data of the normal conducting HESR:

Circumference: Radius of arc: Length of straights: Energy range: No. of dipoles: No. of quadrupoles: No. of sextupoles: Cooling systems:

periment

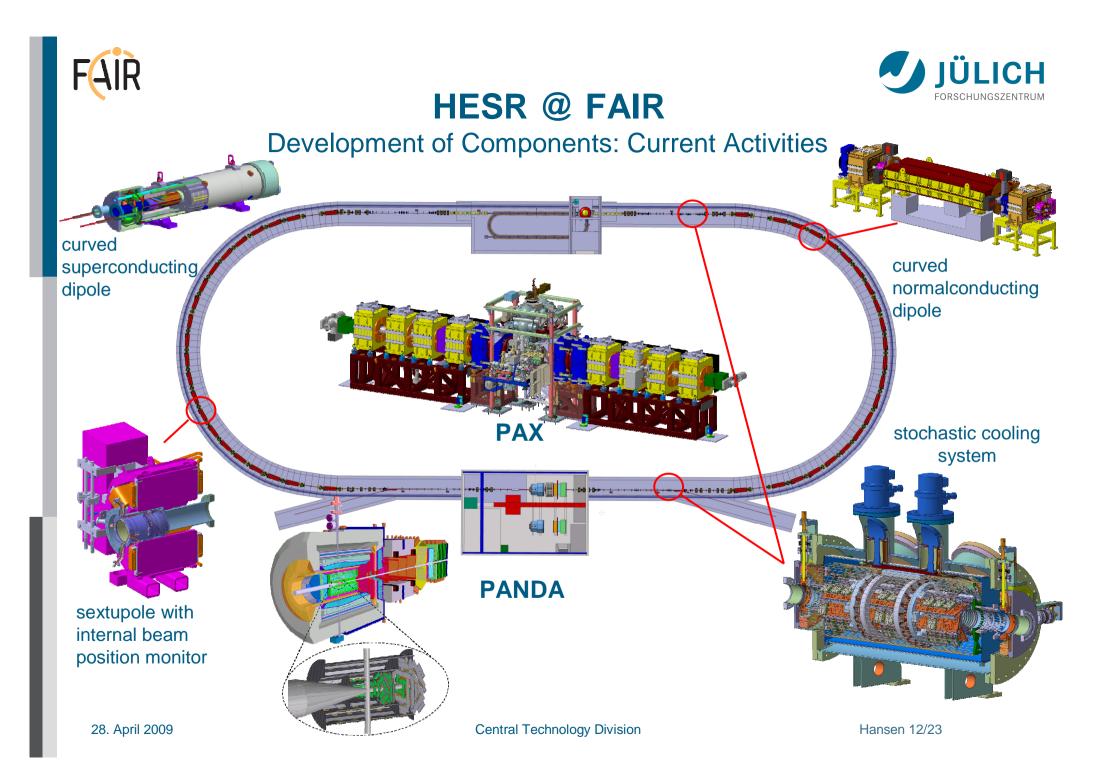
575 m 49,5 m 132 m 1,5 ... 15 GeV/c (831 MeV ... 14,1 GeV 44 (l = 4, 2 m)84 (I = 0,6 m) 64 (l = 0, 3 m)Electron-Cooler (2 - 4/8 MeV) + stochastic cooling system (2 - 4/6 GM)PANDA and later on PAX injection north (protons)

injection south (antiprotons)

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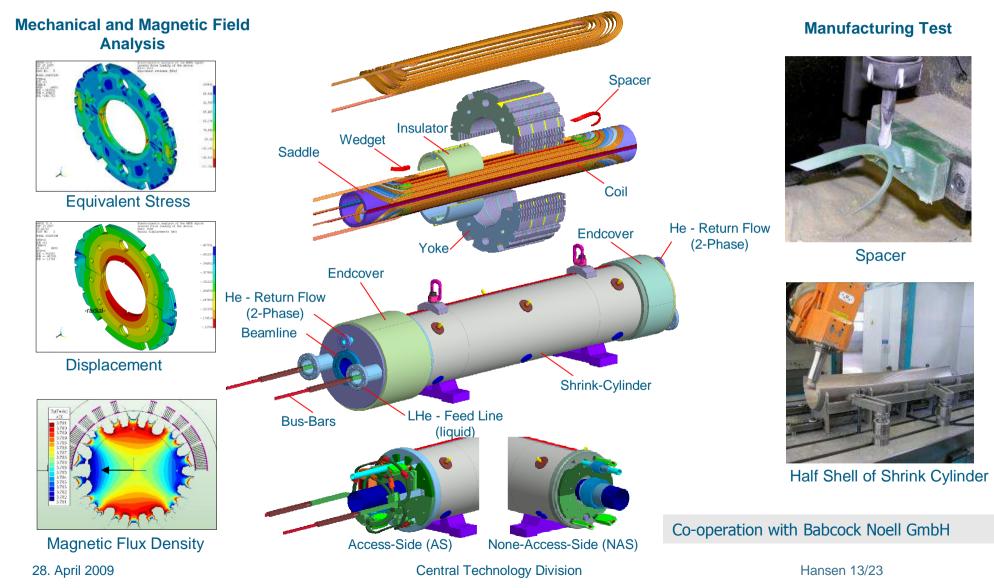


l der Helmholtz-Gemeins



HESR @ FAIR

Component design: superconducting $cos(\theta)$ -dipole

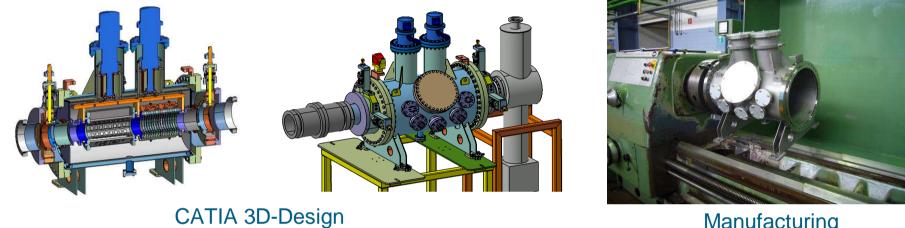






HESR @ FAIR

Component design: Test Vessel for Stochastic Cooling System 2 – 4 GHz



Manufacturing



Assembly of electronics inside clean room

Assembly of vacuum chamber inside clean room

Vacuum and cold test

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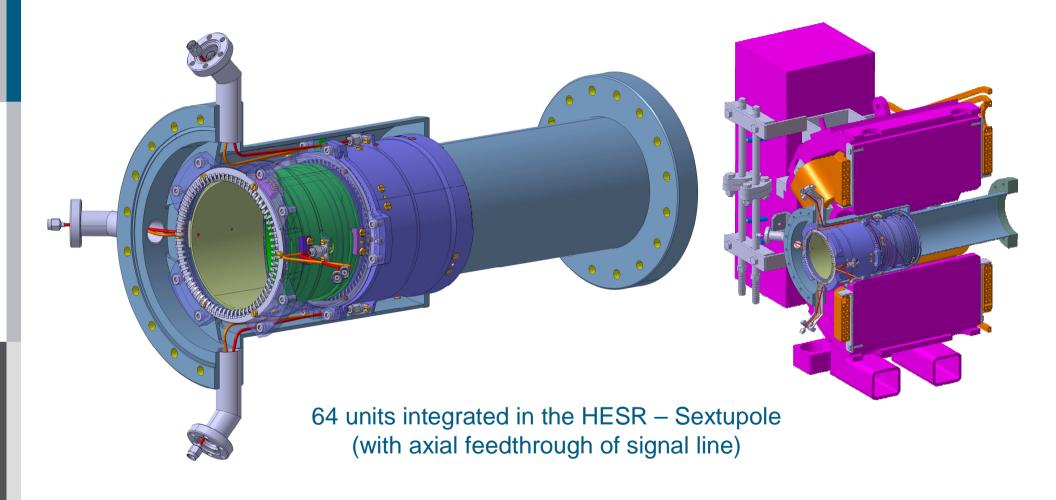
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HESR @ FAIR

Component design: Beam Position Monitor

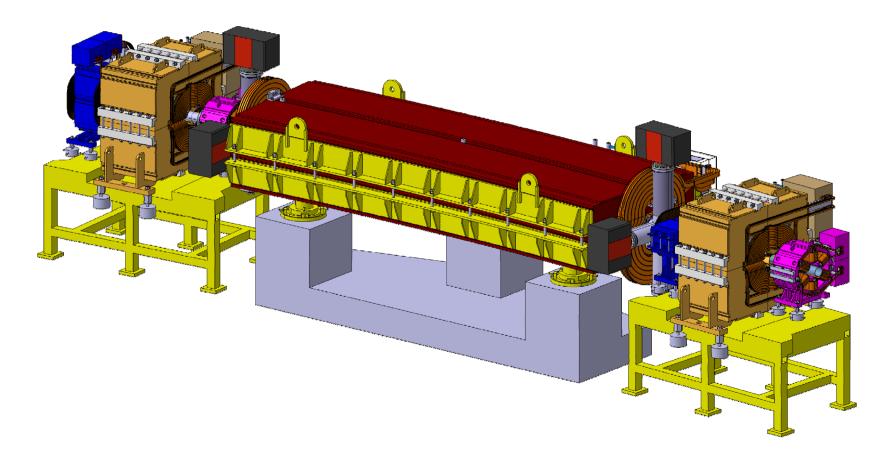






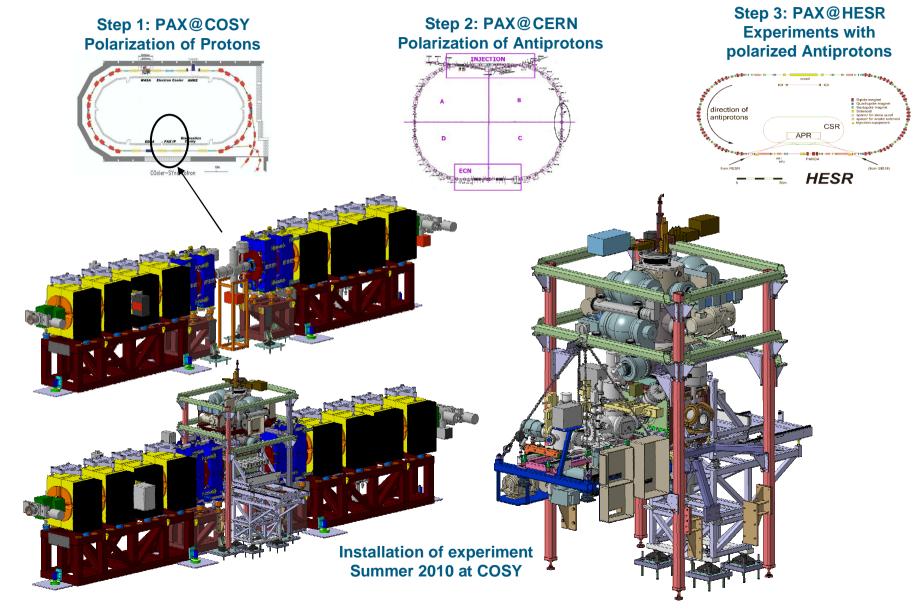


Component design: Curved Normalconducting Dipole









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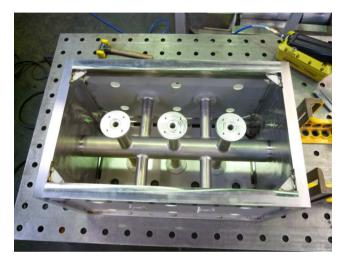
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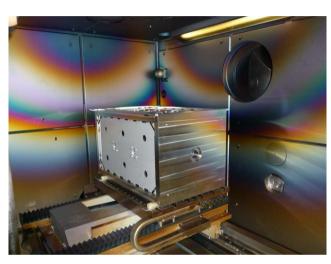
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Target-Chamber: Manufacturing and E-Beam welding at ZAT







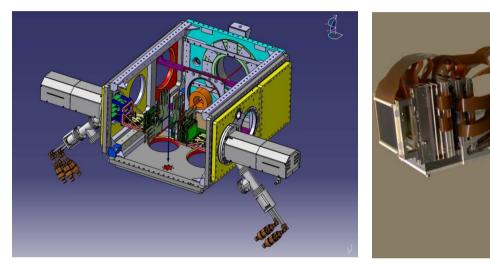


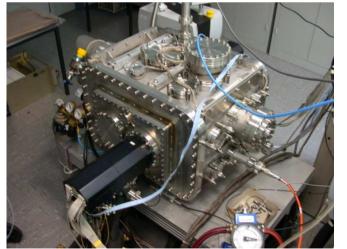
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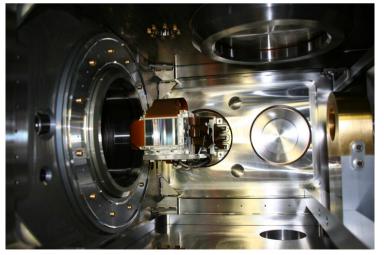




Manufacturing of PAX Polarimeter with ANKE Silizium Telescope at ZAT







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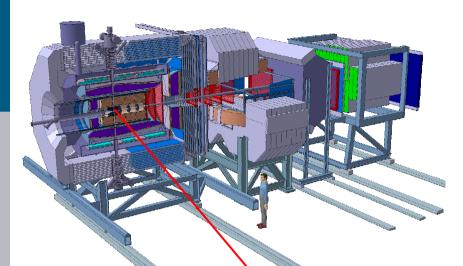
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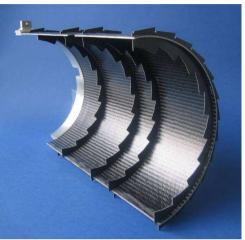




PANDA @ HESR

Micro Vertex Detector (MVD)

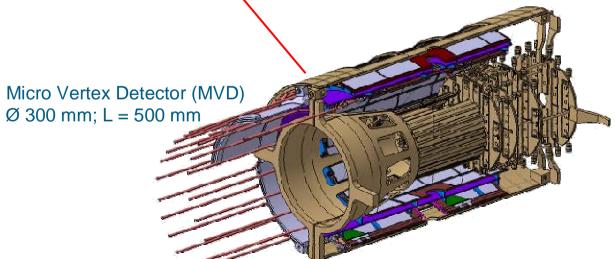


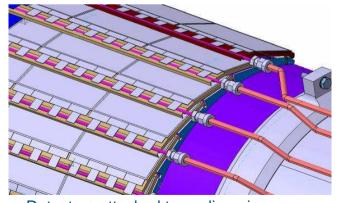


Carbon fiber reinforced plastic (CFRP) Support structure for Strip-Detector



Manufacturing of CFRP components at ZAT





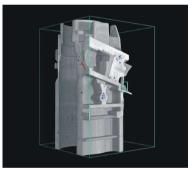
Detectors attached to cooling-pipes

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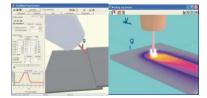




Arc Welding Techniques and Automation



Testing Technology and Materials Characterisation



Simulation of welding process

www.wir-fuegen-alles.de



Laser and Elektron Beam Welding

Fügetechnisches

Exzellenzzentrum







Vacuum Brazing and **Diffusion Welding**



Jülich–Aachen Research Alliance

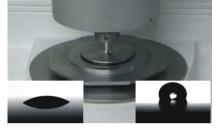
Resistance Welding and Friction Welding Central Technology Division



Welding Manufacturing and Apparatus Construction

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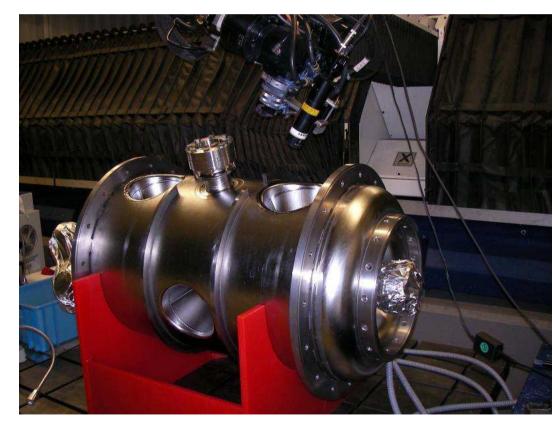
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Superconducting Spoke-Resonators Complete apparatus made of Nb, Electron beam welding 700 MHz 352 MHz





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Thank you

for your attention!



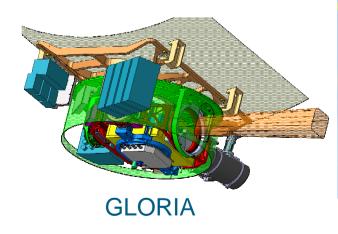
Environment: Stratosphere, Troposphere





Zeppelin-NT







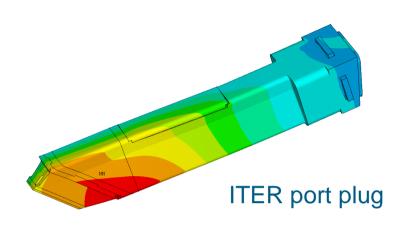
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Energy

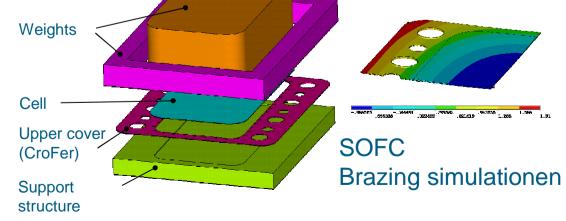


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CO₂ Separation



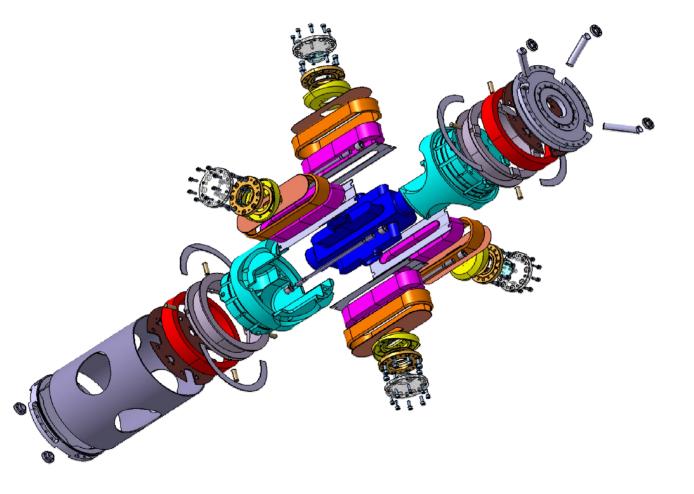


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ATRAP II (CERN) Antiproton and Positron Trap





Thank you

for your attention!