

FZJ Status of Planning for PoF IV

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FZ Jülich & RWTH Aachen

December 12th, 2018
MT POF IV Strategy Meeting
HZB, Berlin

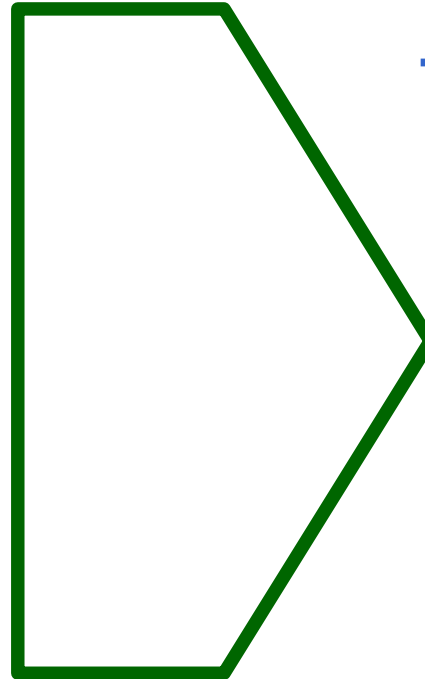
Status of Planning

FZJ Institutes Contributing to MT:

IKP-1 and 4
(Institut für Kernphysik)

JCNS
(Jülich Center for Neutron Science)

PGI-6
(Peter-Grünberg Institut)



Planning for PoF IV:

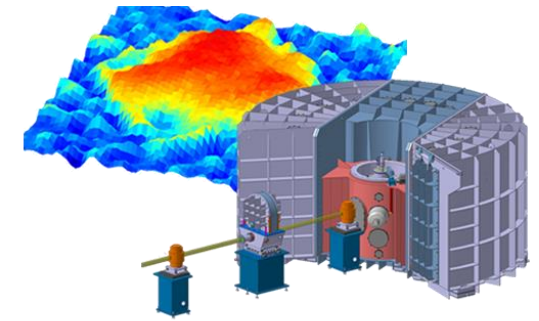
TransFAIR: MT-ARD-ST2 via GSI
(Separate Talk in ARD Session)

Associated with MT-DMA
(Separate Talk in DMA Session)

Associated with MT-ARD-ST4

FZJ: JCNS in PoF IV (Programm Matter)

- Program: Matter, Materials and Life (MML)
 - LK I: Research Topic: Materials – quantum, complex and functional materials
 - JCNS-1 / ICS-1: Soft matter
 - JCNS-2 / PGI-4: Quantum phenomena
 - LK II: Neutron Facilities
 - JCNS: Outstations MLZ, ILL, user service



- Program: Matter and Technologies (MT)

- LK I: Research Topic: Data management and analysis (DMA)
JCNS: Scientific Computing (5 FTE)

ST 1: The MATTER Information Fabric (remote access)

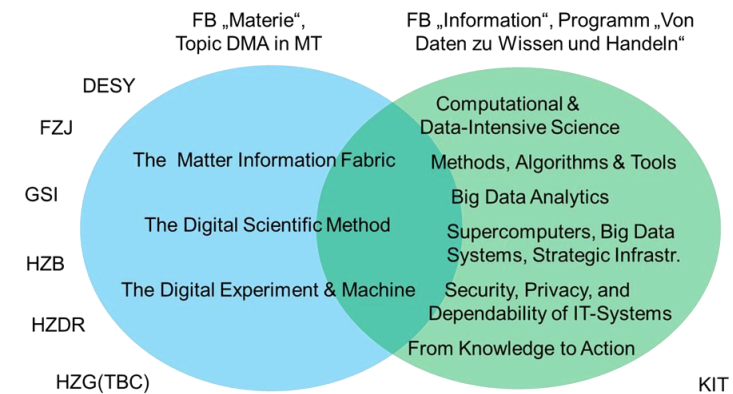
ST 2: The Digital Scientific Method (data analytics & simulation)

ST 3: The Digital Experiment and Machine (control systems)

(Separate Talk by T. Gutberlet in DMA Session)

- Innovationspool Project HBS (MML, MT)

- High current accelerator systems for future HBS
(JCNS, IKP-4, HIM, HZG) (~6 FTE)



Workshop of the research area Information and the future topic DMA, 14-15.1.2018, DESY



FZJ: PGI-6 in PoF IV (MT-ARD)

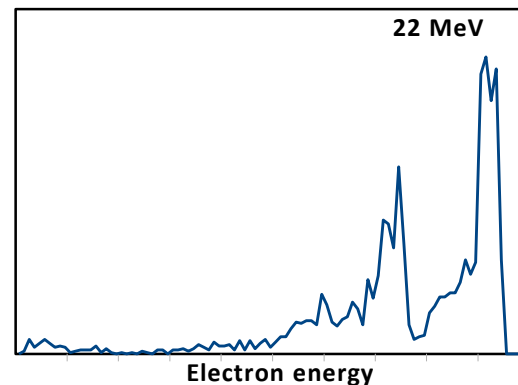
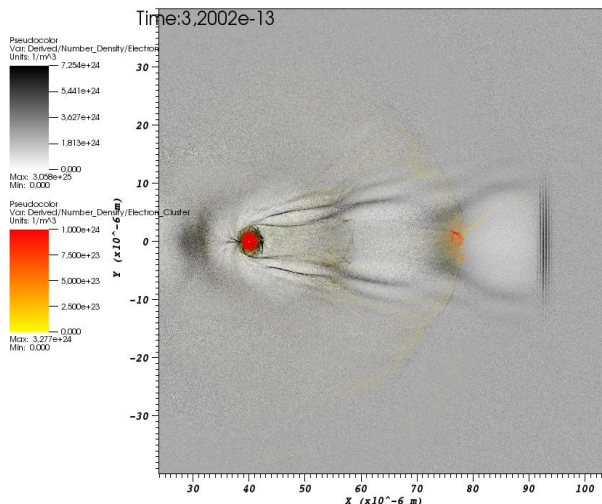
- Two new laser systems (JuSPARC I):

- THALES** (40 mJ / 30 fs / 1 kHz) for SOFT X-RAY MAGNETO OPTICS
- AMPHOS** (50 μ J / 100 fs / 10 MHz) for PHOTOELECTRON SPECTROSCOPY

- Participation in ATHENA_e: kHz Betatron radiation source

Injection of as electron bunches from nm-sized solid targets into a wake field

Simulation results (Thales parameter): Development of Cluster Targets:



$\epsilon \sim 0.06 \pi$ mm mrad (90%, 0.2 pC)



nm-sized cryogenic
hydrogen clusters

Cooperation partner: JSC, PGI-6, IKP-4, HHUD, WWU



FZJ: PGI-6 in PoF IV (MT-ARD)

- Participation in ATHENA_n: Development of polarized targets for proton and ion acceleration (and, maybe, electrons)

- Hyperpolarized ³He gas-jet („static“ polarization)
First experiments @PHELIX in 2019



- Nuclear polarized H atoms from HCl jet („dynamic“ polarization)
Commissioning @ SIOM in 2020



Polarized molecular Hydrogen gas target
Polarized solid HD and D₂ Target



- Simulation of Laser-plasma acceleration of polarized hadrons



FZJ cooperation partner: PGI-6, JSC, IKP-2 and 4
HHU Düsseldorf, Institut für Theoretische Physik

- Connection to MT:

- Participation in ATHENA
- Associated with MT-ARD-ST4
(Electron and Hadron Acceleration)

