MATTER AND TECHNOLOGIES

HELMHOLTZ
RESEARCH FOR GRAND CHALLENGES

Status
Accelerator Research and Development

Andreas Jankowiak, HZB
Spokesperson ARD program topic

June 12th, 2018
4th Annual MT Meeting
HZB, Berlin-Adlershof

Outline

- **A**ccelerator **R**esearch and **D**evelopment within **M**atter and **T**echnologies
- Strategic Invest, Helmholtz Association

  BESSY VSR = **V**ariable Pulse Length **S**torage **R**ing upgrade of **BESSY II**

  ATHENA = **A**ccelerator **T**echnology **HE**lmholtz i**N**fr**A**structure
- Highlights ARD research in ST1, ST2, ST3 and ST4
- Glimpse into the Results of the POF III Ex-Post Evaluation Review
- Miscellaneous

  Committee for Accelerator Physics, AKBP, Events, Awards

ARD in POF III – Sub-Topic structure

Accelerator Research and Development

Speaker: A. Jankowiak, HZB / deputy Speaker J. Osterhoff, DESY

ST1	ST2	ST3	ST4
Superconducting RF Science and Technology	**Concepts and Technologies for Hadron Accelerators**	**Picosecond and Femtosecond Electron and Photon Beams**	**Novel Acceleration Concepts**
J. Knobloch, HZB P. Michel, HZDR	A. Lehrach, FZJ P. Spiller, GSI	H. Schlarb, DESY A.-S. Müller, KIT	U. Schramm, HZDR F. Grüner, U-Hamburg
DESY **GSI** ***HIM*** **HZB** **HZDR**	**GSI** **FZJ** ***HIJ*** ***HIM*** HZDR	**DESY** **FZJ** **HZB** **HZDR** **KIT**	**DESY** **FZJ** **GSI** ***HIJ*** **HZDR** **KIT**

ARD – Helmholtz strategic investment

Two projects defined and application to Helmholtz in 2015/2016/2017:

BESSY VSR

Variable Pulse Length Storage Upgrade to BESSY II
Theme "maintain high brilliance and add simultaneously short pulse (ps) capabilities to storage rings"
29.4 Mio€, thereof 11,9 Mio€ HGF, 7.5 Mio€ EFRE (EU / Berlin), and 10 Mio€ HZB contribution
review in 2015 – "outstanding"
final granted in 2017
Project start in 2018

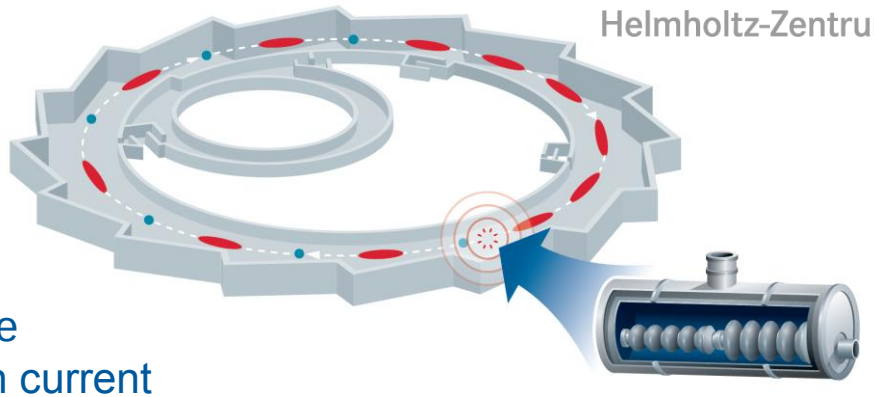
ATHENA

Accelerator Technology HElmholtz iNfrAstructure
Theme „Plasma Acceleration towards User Readiness"
30 Mio€ application plus additional 12.5 Mio€ own invest
review in 2015 – "outstanding"
final granted in 2017/2018
Project start in 2018

Variable Pulse Length Storage Ring – A Smart Idea

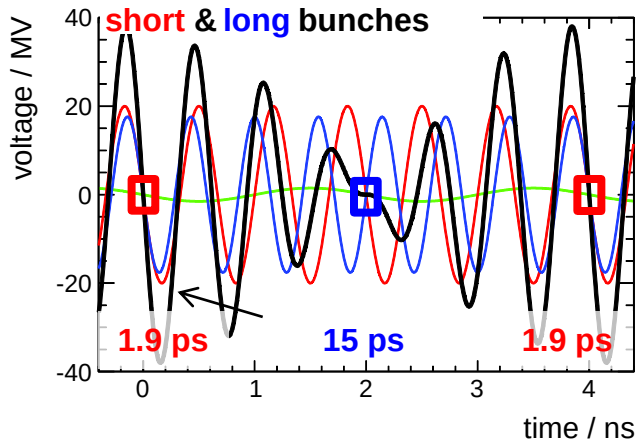
$$\sigma \propto \delta_0 \sqrt{\frac{E_0}{\omega_0} \cdot \frac{\alpha}{\omega_{rf} V_{rf}}} \qquad I \propto \alpha$$

BESSY VSR
Helmholtz-Zentrum Berlin



high voltage (20 MV/m) cw multi-cell SC cavities allow to increase the total voltage gradient by two orders of magnitude
→ ca. 1/10 bunch length @ constant bunch current

Combining two RF systems with different frequencies (1.5 GHz & 1.75 GHz) generates long and short buckets, which can be filled individually to generate optimized fill pattern.

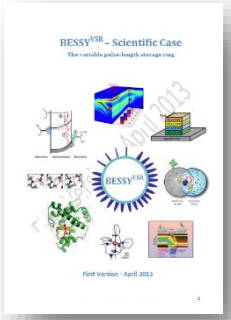


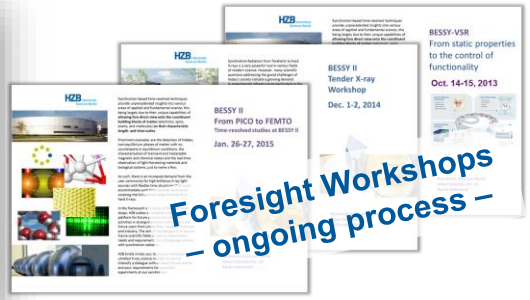
1.5 MV @ 0.5 GHz
16 MV @ 1.5 GHz
14 MV @ 1.75 GHz

J. Feikes, P. Kuske, G. Wüstefeld EPAC 2006
G. Wüstefeld, A. Jankowiak, J. Knobloch, M. Ries, IPAC 2011

BESSY VSR – From Idea → Science → Upgrade Project

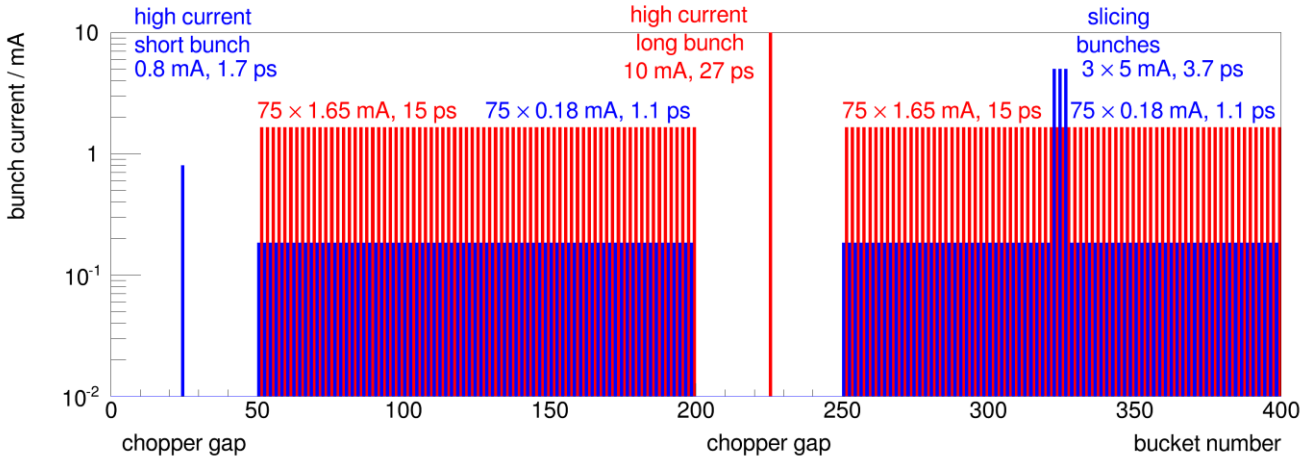
2013 Science Case → 2015 Technical Design Study → 2017/2018 Funding + Start Implementation





Talk A. Föhlisch

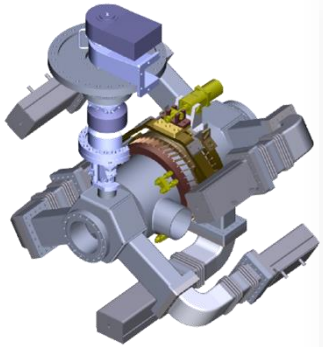
- EFRE project funded: SupraLab@HZB
- HGF Strategic Invests: Funding decision taken → Project Start 29.4 Mio€, 2017 - 2021



BESSY VSR is the second funded upgrade of an European 3rd generation light-source and will provide a multi-mode hybrid fill pattern with advanced timing capabilities, tailored to the needs of the BESSY II user community.

BESSY VSR – Status and Realisation

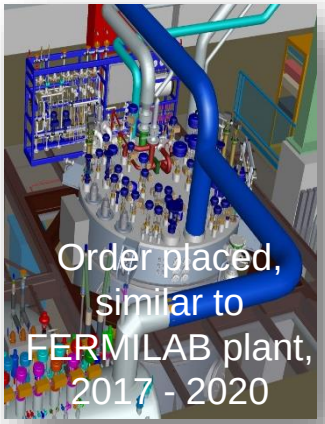
4 cell, 1.5/1.75 GHz waveguide damped HOM cavities



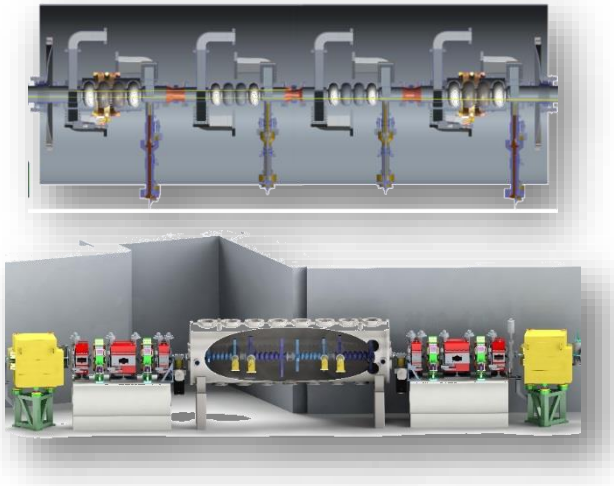
Talk A. Velez

Poster Y. Tamashevich

1.8K cryo plant



Module design & system integration



2018	2019	2020	2021	2022
tendering cavities & SSA transmitter	**installation & commissioning cryo-plant**	**prep. phase cryo-module 2 x 1.5 GHz (assembly, test, beam test)**	**full BESSY VSR 2 x 1.5 GHz & 2 x 1.75 GHz (assembly, test, user operation)**	

BESSY VSR is the efficient mid-term upgrade to BESSY II, and opens up new capabilities for storage rings in general.

ATHENA 30 M€ Strategic Investment into ARD Infrastructure for Helmholtz Development of Laser-Driven Plasma Accelerators

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DESY. HZDR HZB Helmholtz Zentrum Berlin HI Jena Helmholtz Institute Jena KIT Karlsruhe Institute of Technology GSI JÜLICH FORSCHUNGSZENTRUM

A common project by all ARD centers, funded by Helmholtz and BMBF (Pakt für Forschung)

1 **50 GV/m electron accelerator with usable beam quality**

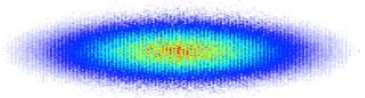
Flagship at DESY, build infrastructure for developing 1 GeV pilot FEL, < 100 MeV injector, medical imaging applications

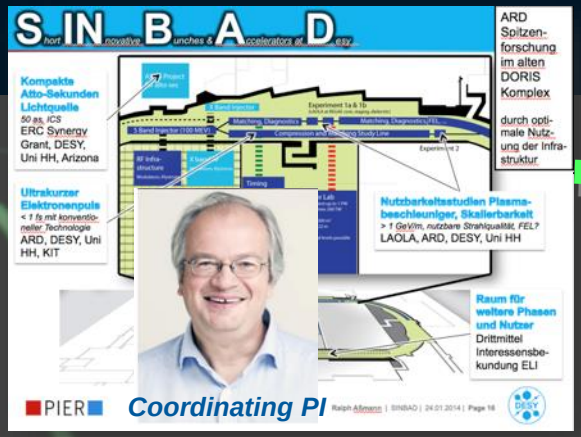
2 **Compact p/ion accelerator towards higher average flux**

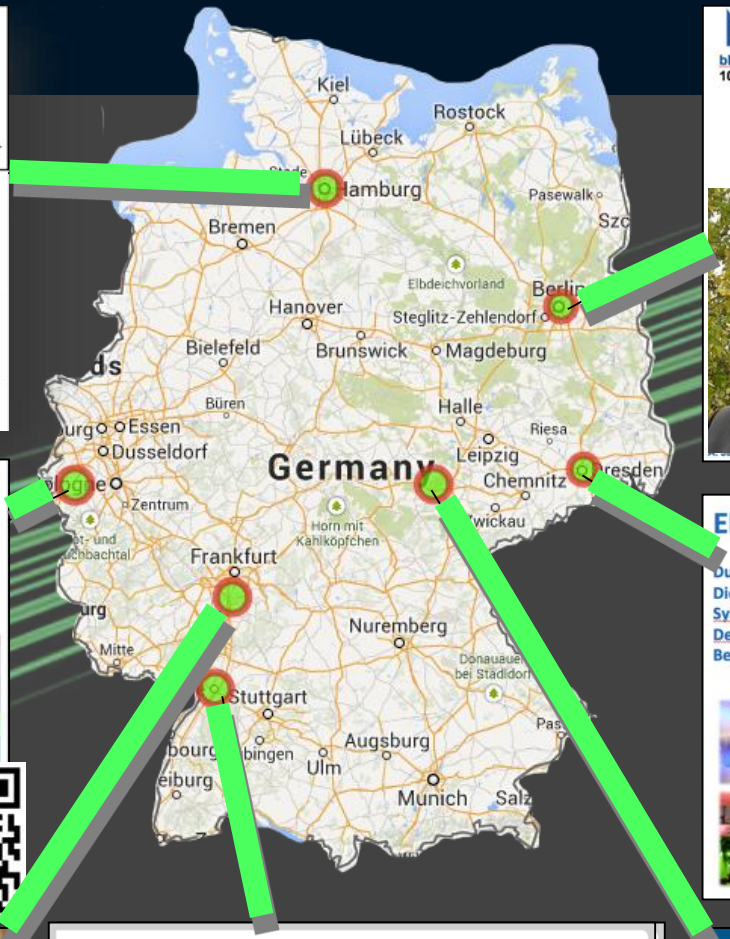
Flagship at HZDR, build infrastructure for developing applications in medical, plasma and material areas

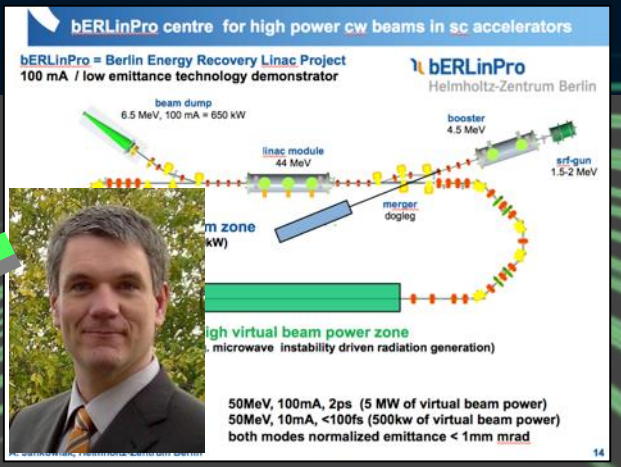
Two common flagship projects

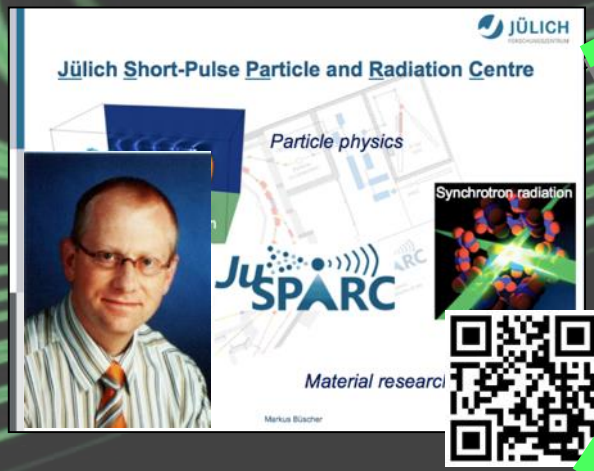
➡ **R&D infrastructure in and applications for all centers**

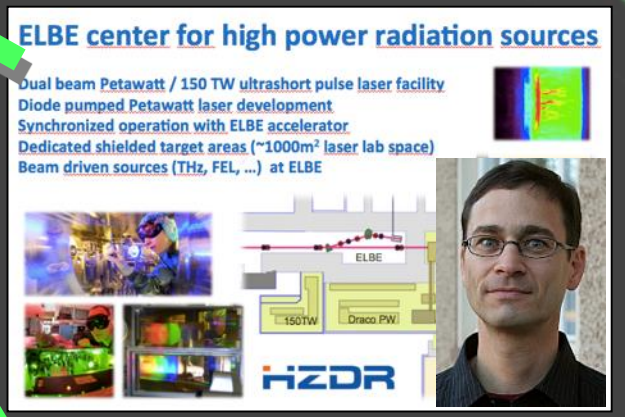


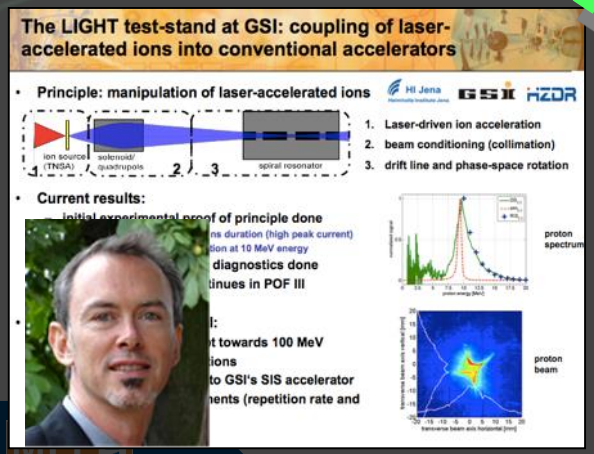

S IN B A D
ARD Spitzen-forschung im alten DORIS Komplex
durch opti-male Nutz-ung der Infra-struktur
Kompakte Atto-Sekunden Lichtquelle
50 as, ICS
ERC Synergy Grant, DESY, Uni HH, Arizona
Ultrakurzer Elektronenpuls
< 1 fs mit konventio-neller Technologie
ARD, DESY, Uni HH, KIT
Nutzbarkeitsstudien Plasma-beschleuniger, Skalierbarkeit
> 1 GeV/m, nutzbare Strahlqualität, FEL?
LAOLA, ARD, DESY, Uni HH
Raum für weitere Phasen und Nutzer
Drittmittel
Interessensbe-kundung ELI
PIER
Coordinating PI


Kiel
Rostock
Lübeck
Hamburg
Pasewalk
Bremen
Elbdeichvorland
Berlin
Hanover
Steglitz-Zehlendorf
Bielefeld
Brunswick
Magdeburg
Büren
Halle
Essen
Dusseldorf
Riesa
Leipzig
Germany
Chemnitz
Zentrum
Horn mit Kahlköpfchen
Frankfurt
Nuremberg
Mitte
Donauaue bei Stadldorf
Stuttgart
Augsburg
Ulm
Munich

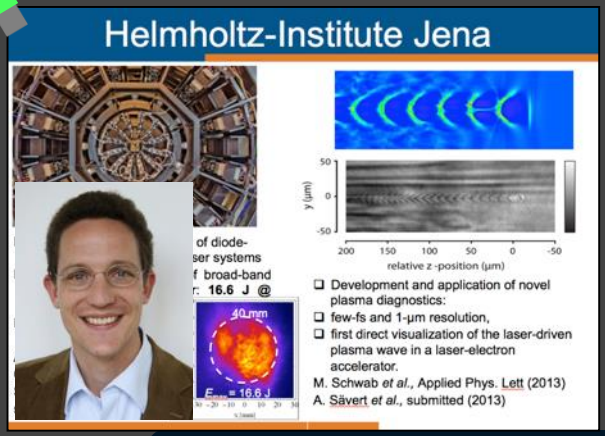

bERLinPro centre for high power cw beams in sc accelerators
bERLinPro = Berlin Energy Recovery Linac Project
100 mA / low emittance technology demonstrator
bERLinPro
Helmholtz-Zentrum Berlin
beam dump
6.5 MeV, 100 mA = 650 kW
booster
4.5 MeV
linac module
44 MeV
srf-gun
1.5-2 MeV
merger
dogleg
50MeV, 100mA, 2ps (5 MW of virtual beam power)
50MeV, 10mA, <100fs (500kw of virtual beam power)
both modes normalized emittance < 1mm mrad


JÜLICH
Jülich Short-Pulse Particle and Radiation Centre
Particle physics
Synchrotron radiation
JuSPARC
Material researc


ELBE center for high power radiation sources
Dual beam Petawatt / 150 TW ultrashort pulse laser facility
Diode pumped Petawatt laser development
Synchronized operation with ELBE accelerator
Dedicated shielded target areas (~1000m² laser lab space)
Beam driven sources (THz, FEL, ...) at ELBE
ELBE
150TW
Draco PW
HZDR

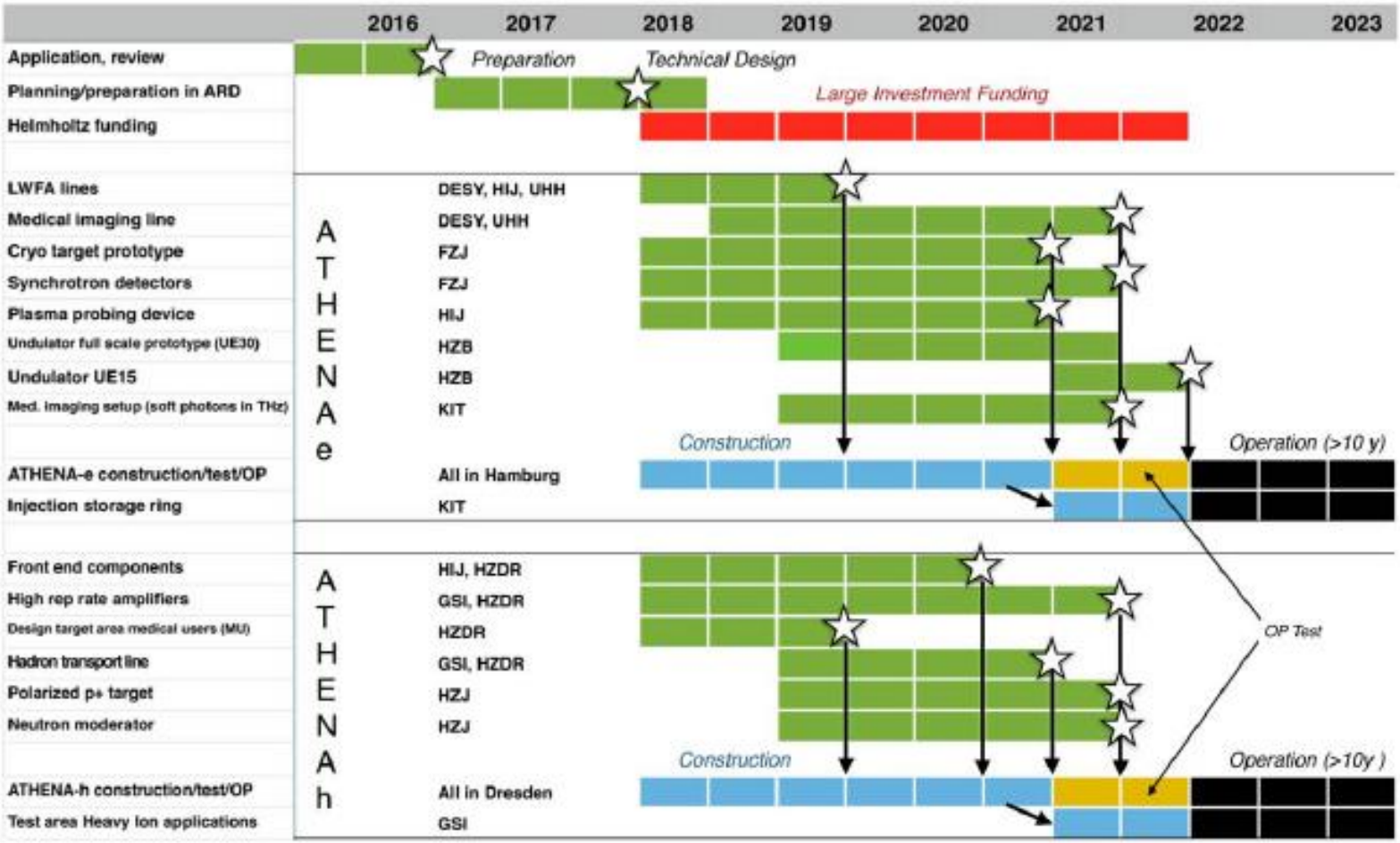

The LIGHT test-stand at GSI: coupling of laser-accelerated ions into conventional accelerators
Principle: manipulation of laser-accelerated ions
HI Jena
GSI
HZDR
1. Laser-driven ion acceleration
2. beam conditioning (collimation)
3. drift line and phase-space rotation
ion source (TNSA)
solenoid/ quadrupole
spiral resonator
Current results:
diagnostics done
proton spectrum
proton beam


FLUTE: ARD-Forschung am KIT
KIT
Ultrakurze Elektronenpulse (1 fs bis 300 fs)
Grosser Bereich an Ladungen (1 pC bis 3 nC)
Kohärente Strahlung für Materialwissenschaften und biologische Anwendungen
Entwicklung/Tests von Kurzpuls-Strahldiagnose und Instrumentierung
Kooperation KIT, PSI, DESY
Ferninfrarot Linac-
FLUTE
FLUTE, a Linac-Based THz Source at KIT


Helmholtz-Institute Jena
Development and application of novel plasma diagnostics:
few-fs and 1-µm resolution,
first direct visualization of the laser-driven plasma wave in a laser-electron accelerator.
M. Schwab et al., Applied Phys. Lett (2013)
A. Sävert et al., submitted (2013)
relative z-position (µm)

ATHENA – Accelerator Technology HElmholtz iNfrAstructure

Funding: 30 M€ additional invest into R&D infrastructure
Project start: 12 June 2018 (6 months delay with respect to original schedule)
Duration: 4 years, afterwards operation out of ARD funds



Each star indicates a deliverable from a center to the common flagship installations and the ATHENA project

Note that some deliverables will slip somewhat in time due to delay in project approval but this is acceptable.

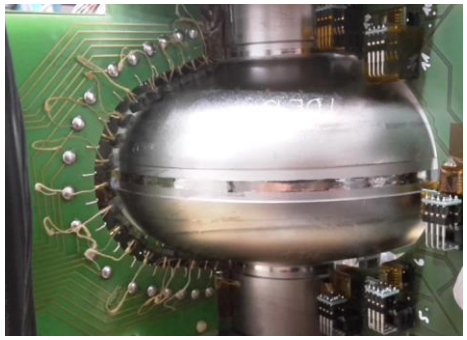
In time project completion is still envisaged

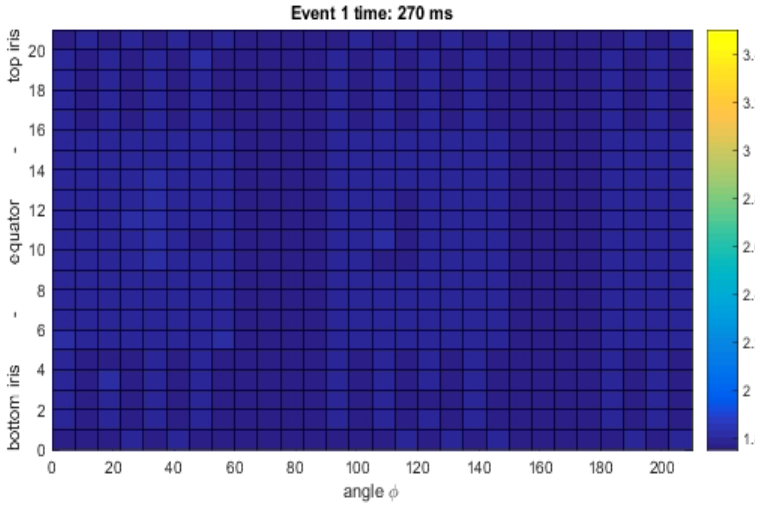
ST1 Highlights – Rapid magnetic field mapping of SRF cavities

Combination of (existing) thermometry and new 3-D magnetic field mapping

- An entire temperature and magnetic-flux map can be obtained in 2 ms.
- Based on inexpensive, high, resolution AMR sensors
- Thermometers from DESY, based on Cornell system.
- Works in superfluid helium during cavity operation
- Observe dynamic effects during cavity quenches or cooldown.
- Essential to better understand trapped flux which is known to be a major contributor to RF power dissipation

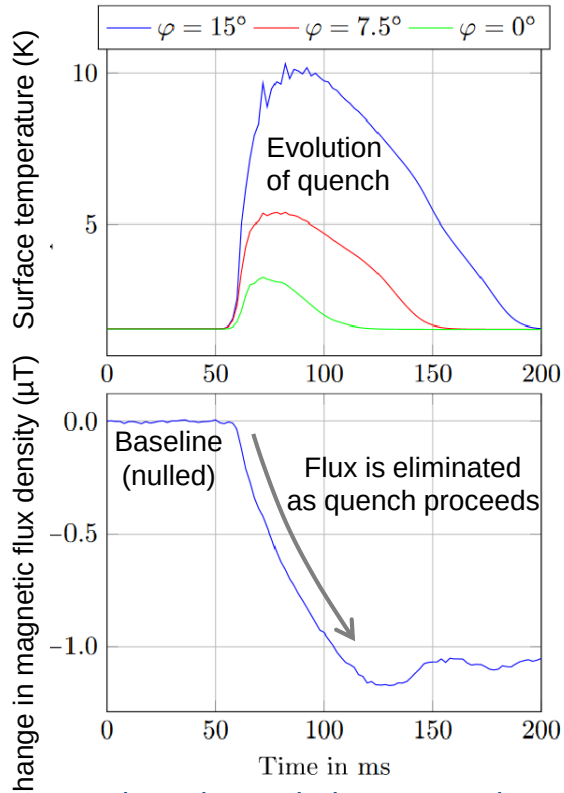
Measurement setup: Single-cell SRF cavity with thermal sensors and several 3-D mag-netic field sensors mounted





Movie of temperature maps during a quench due to multipacting. A magnetic field map is obtained at the same time.

Data evaluation of individual sensors

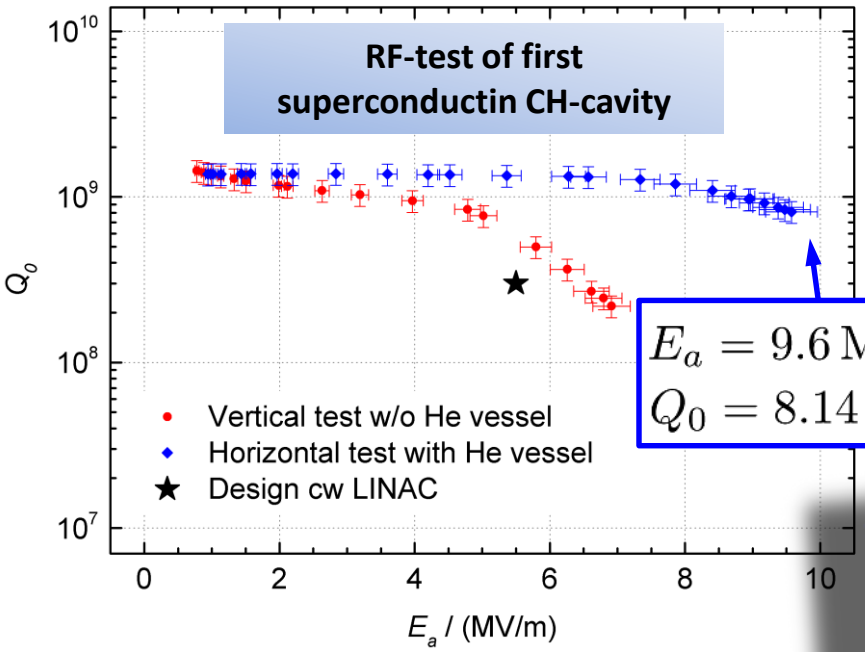


Flux release during a quench*

(*Note: Not same data as in the map)

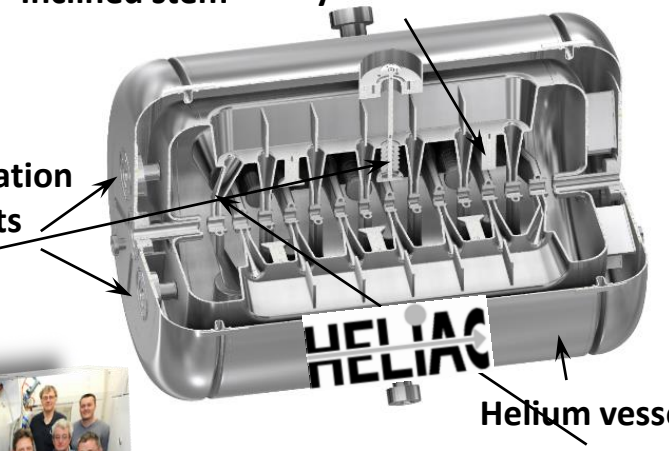
ST1 – First heavy ion beam acceleration with a sc-CH-cavity

RF-test of first superconductin CH-cavity

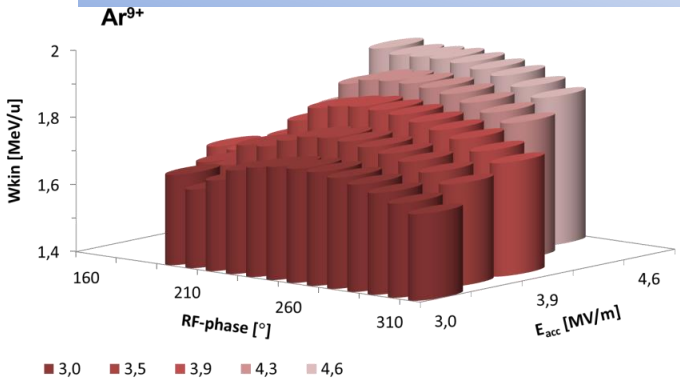


$$E_a = 9.6\,\mathrm{MV/m}$$
$$Q_0 = 8.14 \cdot 10^8$$

15 cell Crossbar H-cavity

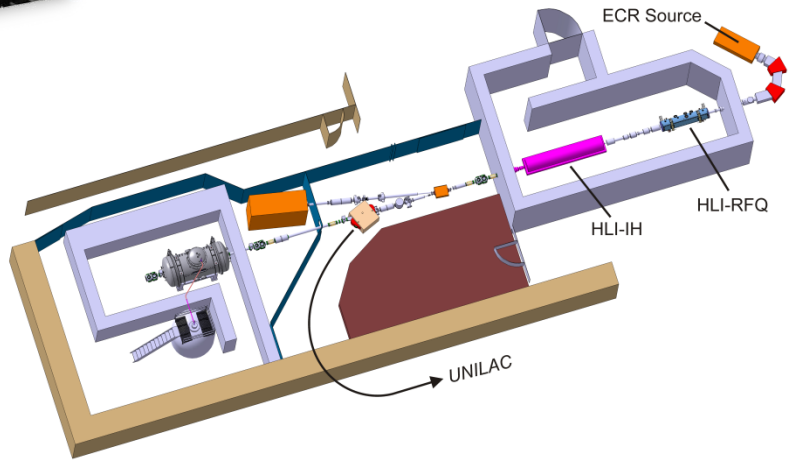


Acceleration with heavy ion beam@GSI

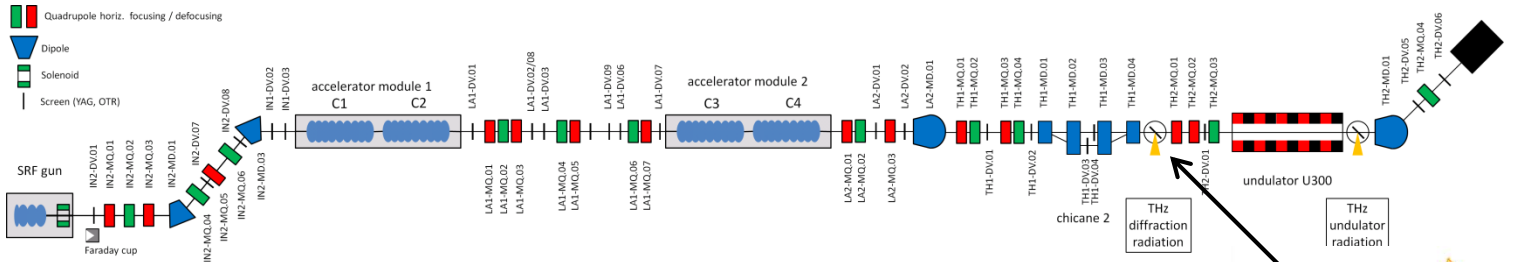


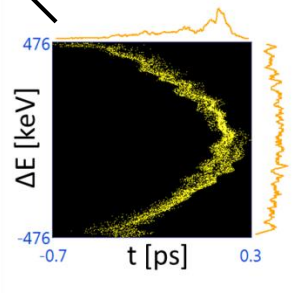
- **Full Beam transmission**
- **Acceleration up to 2.2 MeV/u**
- **Energy variation 1.2-2.2 MeV/u**

Experimental setup of the demonstrator at GSI



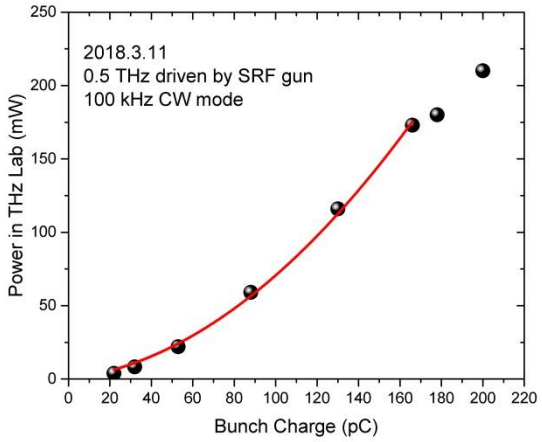
ST1 – SRF gun user operation for THz production at ELBE

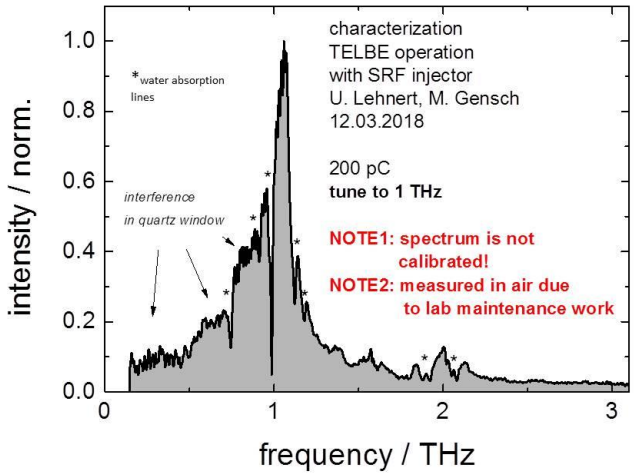




SRF gun delivers 200 pC bunches at 100 kHz CW for TELBE

- production of superradiant coherent diffration and undulator radiation
- successful bunch compression: chirp in linac + magnetic chicane delivers final lengths of 0.2 – 0.4 ps
- Increase of THz power up to factor 4 compared to thermionic injector





ST1 – Any other Business (Workshops, Talents, Projects, Patents, ….)

ARD Workshop: On Perspectives of Photocathode Lasers for Photo Injectors

- 11 April, 2017 at Helmholtz-Zentrum Dresden-Rossendorf
- ~ 30 attendees, also from industry

ARD Workshop: Operating SRF systems reliably in a “dirty” accelerator

- 14-15 September, 2017 at Helmholtz-Zentrum Berlin
- ~ 60 attendees
- extensive discussions on how to integrate and reliably operate SRF systems in existing accelerators, looking to experience at operating SRF facilities.

ARD SRF Gun Cluster Meetings

- 24 Oct. 2017 HZB Berlin, 13 Febr. 2018 HZB Berlin, 10 April HZDR Dresden
- DESY, HZB, HZDR on cooperative SRF gun cryomodul development

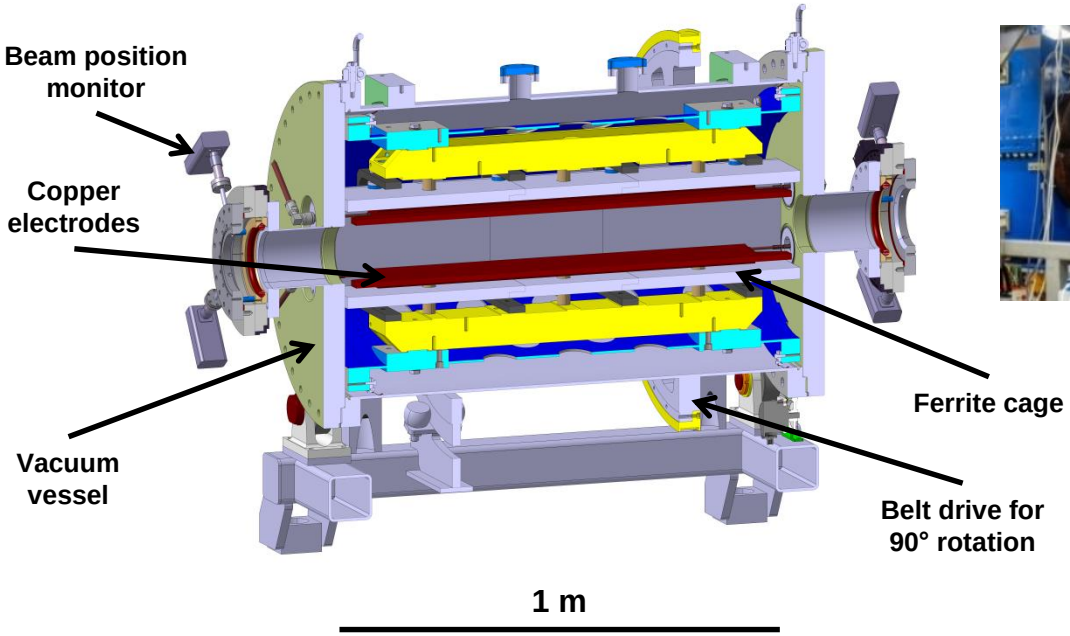
Patent application (HZB)

- Development a 3-D magnetic field mapping system based on AMR sensors for real time measurements of magnetic fields around SRF cavities during operation.

Waveguide RF Wien filter for EDM measurement at COSY

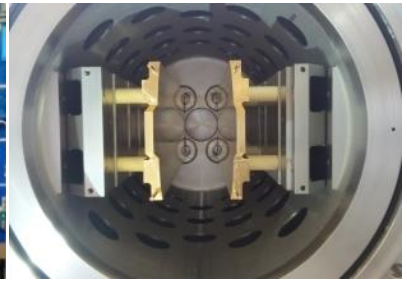
- one of the central ingredients for the measurements

Wien filter mode: Lorentz force is zero
→ no beam oscillations

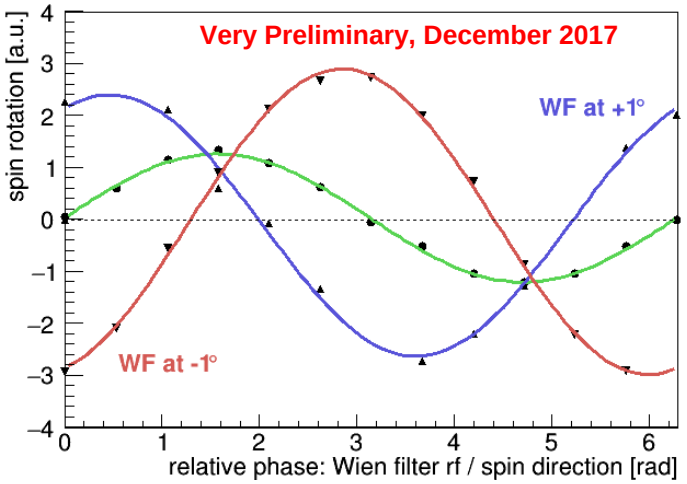


Installation in COSY

Glance into its inside



Commissioning from recent beam time



Development together with IKP-2, RWTH Aachen (IHF) and Central Institute (ZEA-1) in Jülich

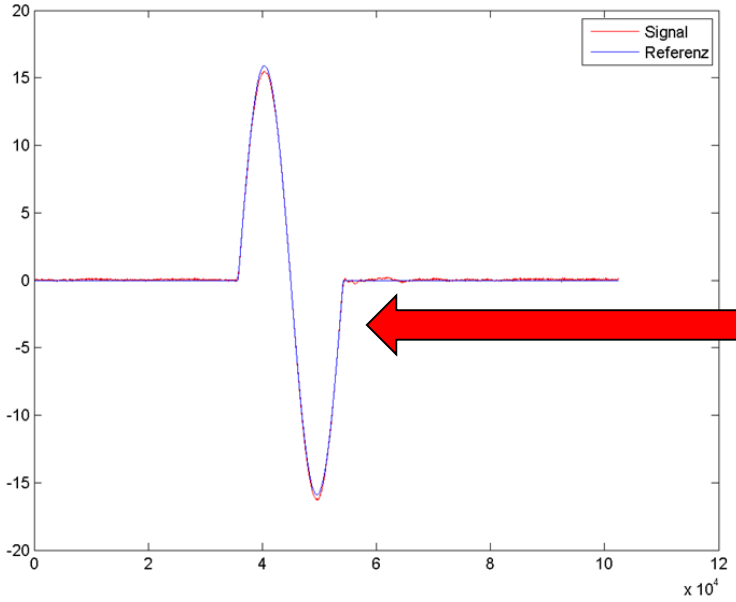
ST2 – Magnetic Alloy loaded broad band cavities

Generation of a single, isolated Rf pulse with highest quality

- ARD Broadband test cavity available (MA-loaded)
- Based on investigations with this test cavity, a **barrier-bucket cavity** for the ESR was designed
- Cooperation of GSI Ring RF department and TU Darmstadt (including ARD and BMBF funding): Development of system for the generation of pre-distorted input signals


ARD Broadband Test Cavity


ESR Barrier Bucket Cavity with LLRF system and amplifiers



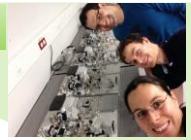
red curve:
measured gap signal of ESR Barrier Bucket cavity (1 kV peak, 1:60 divider, amplifier R&S BBL200)

blue curve: ideal reference

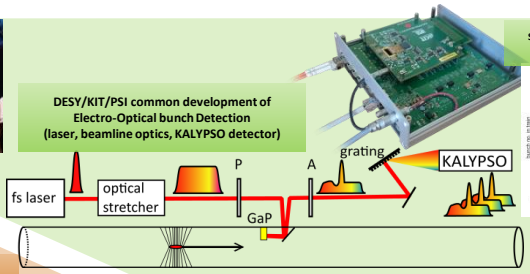
ST3 Highlights – Joint Technology Developments and Networking

Superconducting undulators as commercial product

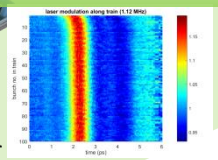
EO laser assembly by ST3 researchers from DESY & KIT



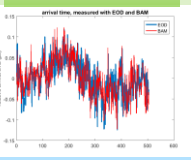
DESY/KIT/PSI common development of Electro-Optical bunch Detection (laser, beamline optics, KALYPSO detector)

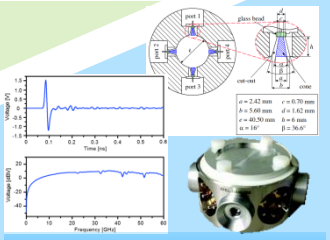


Single shot measurement of a bunch train at XFEL with 1.12 MHz intra-train rate



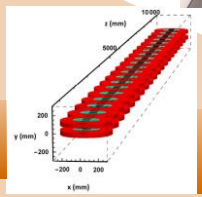
E-bunch arrival time at XFEL measured with EOD and BAM



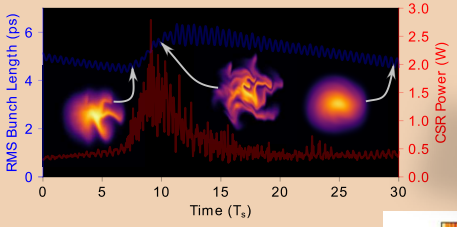


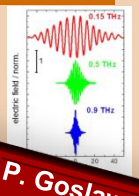
High BW pickup for Bunch Arrival-time Monitors (DESY/HZDR/TU Darmstadt)
Test as ELBE, installed at FLASH and XFEL

White paper on THz pump facility @ XFEL:
"….only accelerator-based sources provide the wide tunability together with high intensity and repetition rates beyond 100 kHz, that will enable a broad application at European XFEL on the most interesting scientific problems in the field….. "



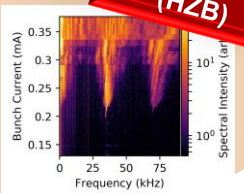
A superconducting THz undulator for the European XFEL (DESY, HZDR, KIT)
Ref.: xfel.tind.io/record/1563





P. Goslawski (HZB)

New fast simulation code "Inovesa" for studies of the longitudinal phase space of ultra-short bunches and the micro-bunching instability in storage rings (HZB/KIT)



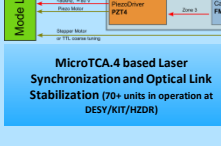
The 'snapshot method': a new experimental way for extremely fast mapping of short-bunch instabilities in storage rings based on the KAPTURE DAQ system and ultra-fast THz detectors (HZB/KIT).

ST3: ps-fs electron and photon beams

Beam dynamics & Photon Sources	ps-fs beam diagnostics	Stability, Controls & Synchronization
Short bunches in linear accelerators	Time domain	Synchronization References
Coh. radiation & high fields in storage rings	Frequency domain	RF Controls
Custom beams: bunch shape manipulation	Electron beams	Control System Advances
Advanced photon sources development	Photon beams	Coherence control XUV Seeding

Technology transfer & Networking & T…

C. Lechner (DESY)

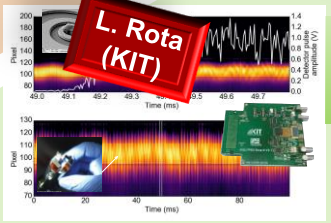


MicroTCA.4 based Laser Synchronization and Optical Link Stabilization (70+ units in operation at DESY/KIT/HZDR)

ELBE optical synchro-nization system, an adapted copy from FLASH (DESY/HZDR)

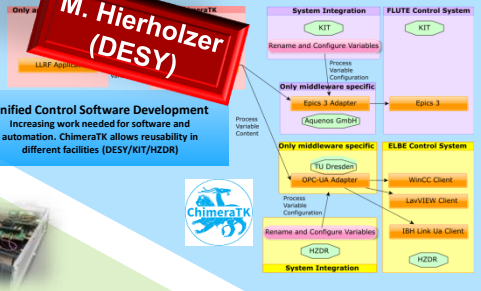
Common MicroTCA.4 based LLRF control at DESY/HZB/KIT/HZDR
Hardware assembly and commissioning, exchange of firmware, test of feedback algorithms, adoption of software for different control systems and automation needs

L. Rota (KIT)

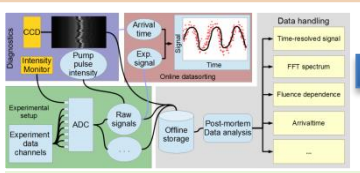


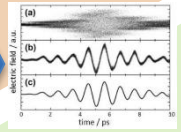
Combining turn-by-turn THz detection and EO profile measurements for short bunches in storage rings with ST3 technologies: YBCO detectors, EO detection, KAPTURE and KALYPSO.

M. Hierholzer (DESY)

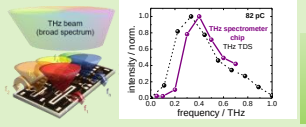


Unified Control Software Development
Increasing work needed for software and automation. ChimeraTK allows reusability in different facilities (DESY/KIT/HZDR)

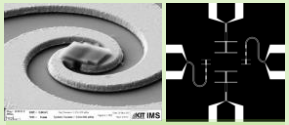




Pulse-resolved DAQ at quasi-cw SRF driven photon sources tested at quasi-cw TELBE test facility:
already implemented in user operation at TELBE & THz-FLASH
demonstrator for XFEL under development (EUCALL)



On-chip THz spectrometer for BCM
tested at quasi-cw TELBE test facility
implementation foreseen at ELBE, FLUTE, FLASH, XFEL



Ultra-fast YBCO single and multi-pixel THz detectors (UVSOR, DELTA, DIAMOND, SOLEIL, HZB, KIT)

KAPTURE and KALYPSO high throughput DAQ systems for electro-optical and THz diagnostics with up to 500 MHz repetition rate (KIT/DESY/HZDR)

E. Bründermann for ST3 see poster session

5th ARD-ST3 Annual Meeting, 19.-21. Jul 2017 @ DESY/Zeuthen, 75 participants

Next meeting ARD-ST3: 26.-28. Sep 2018 @ HZDR

Highlight-Talks

"ChimeraTK: …"/DESY; "XUV seeding …"/DESY

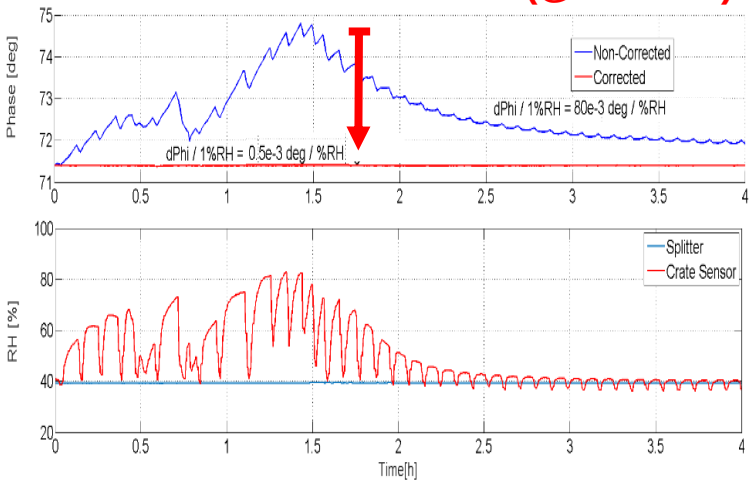
"Beam diagnostics …"/ KIT; "Two beam operation …",/HZB

Drift Calibration Module

- **Fighting humidity …**

Humidity response:

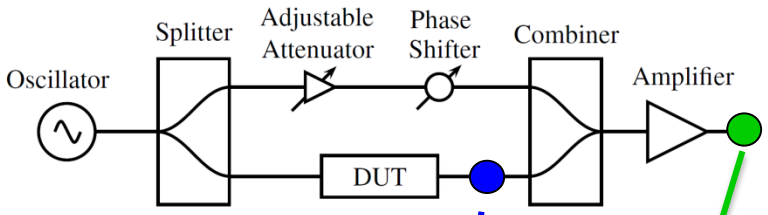
1/160 reduction (@ 1.3 GHz)



Reference: PhD thesis, Jan Piekarski

Field detector with attosecond resolution

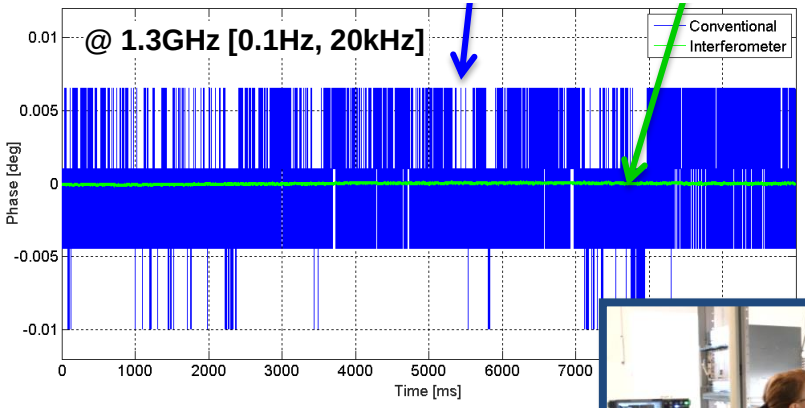
- **Proof-of-concept using RF interferometer technique**

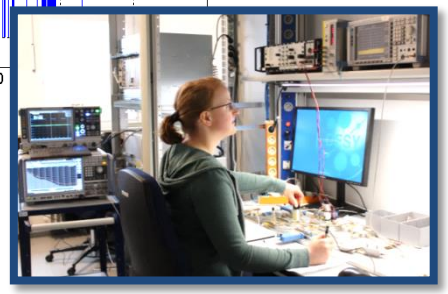


Reduction factor >50:

2.6 mdeg (rms), ≈ 5.5 fs

0.045 mdeg (rms), ≈ 96 as

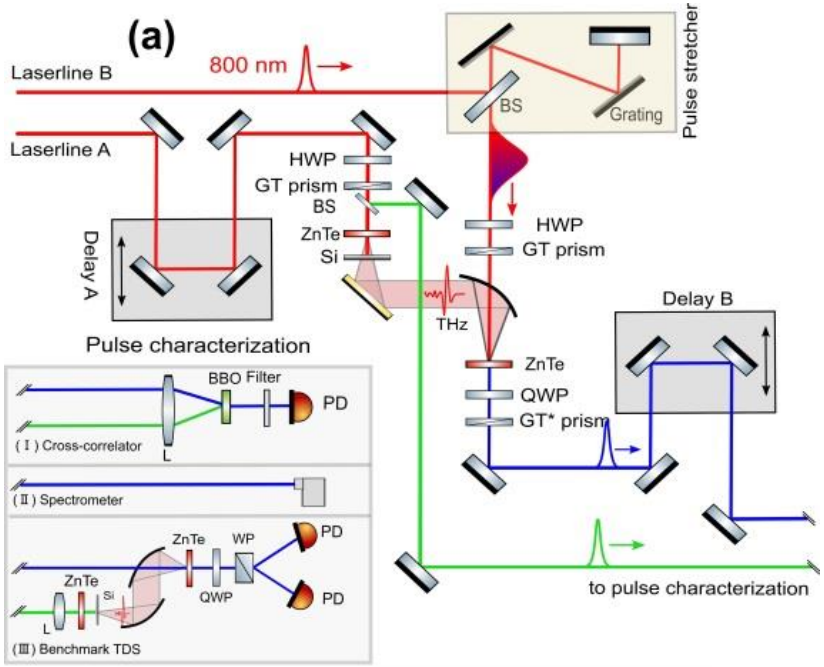


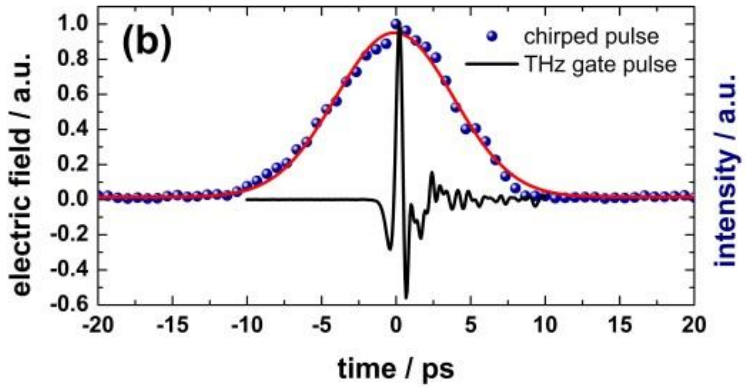


Courtesy: L. Springer, DESY

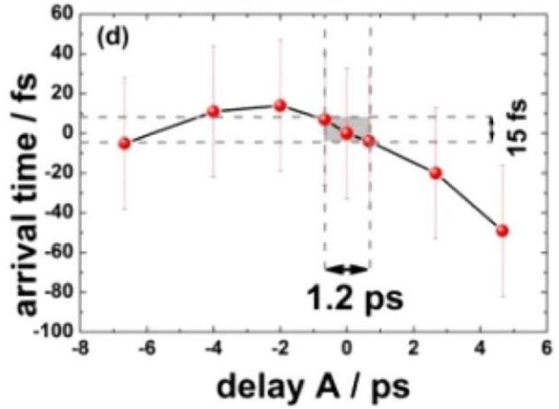
→ See poster session

ST3 – Towards intrinsic laser-accelerator synchronisation by THz slicing





- **Proof-of-principle for laser-accelerator synchronisation based on THz slicing**
- **Arrival time jitter is compensated by almost 2 orders of magnitude**
- **Applicable at any light source based on ultra-short electron bunches**
- **Next generation is under development**



Courtesy: M. Gensch, HZDR

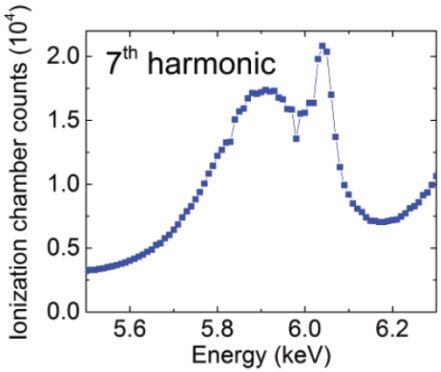
Reference: M. Chen et al, "Towards femtosecond-level intrinsic Laser Synchronization at 4th Generation Lightsources", Opt. Lett. 43, 2213 (2018)

From Development towards a Commercial Product

SCU20 installed and in operation at KIT

- **Reliable operation, first SCU "in-series" production**
- **Higher magnetic field than CPMUs with the same geometry**

Cover of SRN published online 24 May 2018



SCU20's 7th harmonic at NANO beamline through 30 µrad × 30 µrad with an ionization chamber (2.5 GeV)

Reference: S. Casalbuoni, N. Glamann, A. Grau, T. Holubek, D. Saez de Jauregui, S. Bauer, C. Boffo, T. Gerhard, M. Turenne, W. Walter, «Superconducting Undulators: From Development towards a Commercial Product", Synchrotron Radiation News, 31:3, 24-28 (2018)

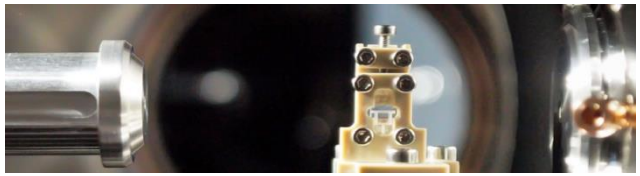
Courtesy: S. Casalbuoni, KIT

KIT Karlsruher Institut für Technologie

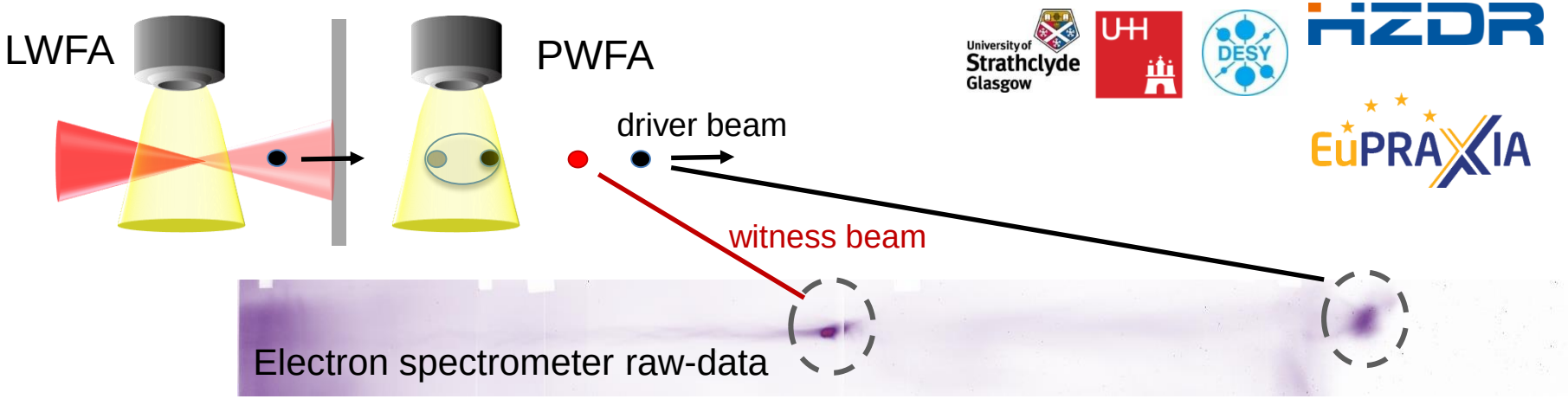
BILFINGER NOELL GMBH

ST4 Highlights – Laser / Plasma Wakefield Acceleration

Stable continuous operation for driving of light sources and accelerator research established in LWFA

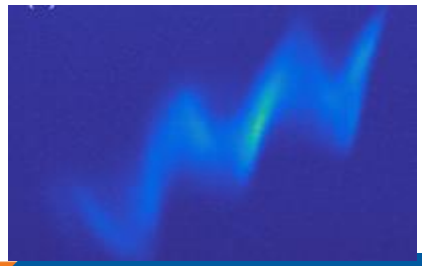


- LUX beamline at DESY / UHH operational
- Multi 10 kA bunches in routine operation
  with real-time characterization at HZDR *driving laboratory scale PWFA stage*



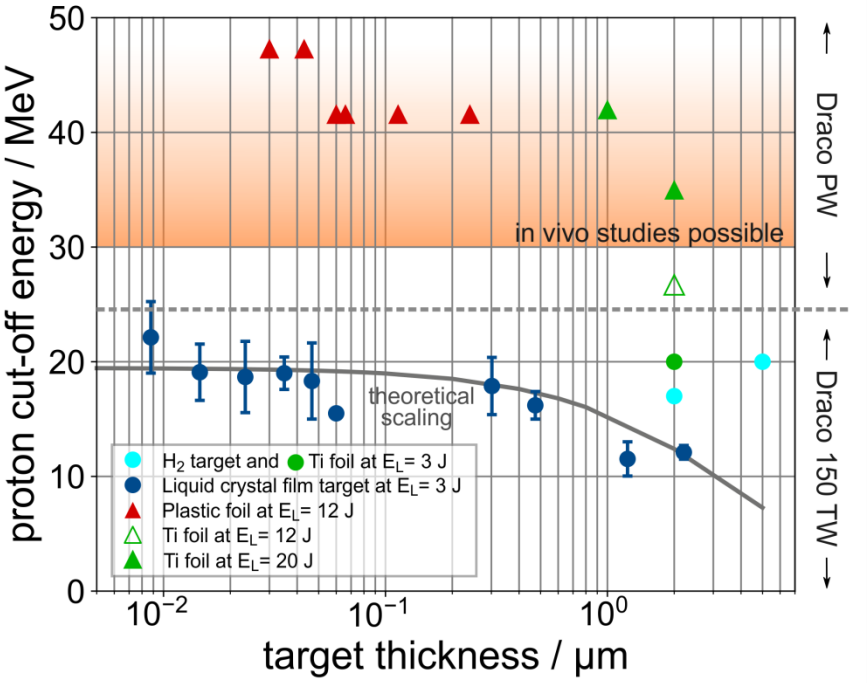
Demonstration of Self-Modulation Instability in PWFA at PITZ

Nat. Commun. *8, 487 (2017)* Phys. Rev. Lett. 120, 144802 (2018)

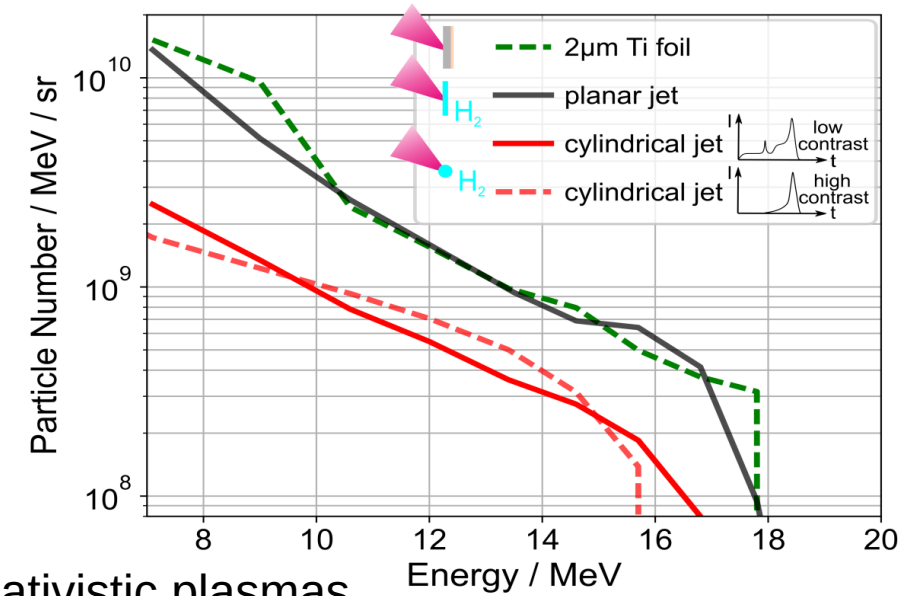


ST4 – Laser Ion Acceleration @ PW level and beam transport

- Scaling of ion acceleration (thin target TNSA) to Petawatt laser power (reaching energy range for in-vivo radiobiology)



- Debris-free cryogenic hydrogen



- Probing the femto-scale dynamics of relativistic plasmas (development of multi-color probes)

Sci. Rep. 7, 10248 (2017), PRL 118, 194801 (2017), NJP 20, 01319 (2018)

POF III ExPost Reviews ARD

Centre	Date	Chair
GSI + HIM / HIJ	21.-23.11.2017	H. Enyo, RIKEN
FZJ	13.-15.12.2017	M.C. Aronson, Texas A&M U
HZB	09.-12.01.2018	A. Harrison
HZDR	16.-19.01.2018	M. Fiebig, ETH Zürich
DESY	05.-09.02.2018	H.E. Montgomery, JLAB
KIT	13.-16.02.2018	A. Taylor, STFC

ca. 100 reviewers for a total of 350 reviewer days (one year of review)

→ but of course not all reviewing ARD  , puuuhh

How are we doing? Extremely well!

Fair to say: we fulfil, even exceed the high expectations set in us.

POF III ExPost Review Results – Overall observations & Recommendations

The creation of the program **MT** … consisting of the program topics **ARD and DTS** is **a success-story**.

... the **R&D activities** of the six contributing centres provide **excellent and outstanding** scientific results which are **aligned with the program and upgrade plans** for the corresponding **large-scale facilities or specific projects**.

The **scientific quality** of the program is at the **highest level internationally**.

Recommendation on the general level:

Establish a program topic "**Data management and Analysis**" (DMA), and develop a **strategic plan** for data handling and computing that **capitalizes on the emerging DMA for the ARD and DTS activities!**

ARD programme MT days 2018

Afternoon Session Tuesday, June 12	
The E-XFEL – From Start-Up to User Operation – Lessons Learned	Winni Decking, DESY
Advanced Controls and Machine Learning for Accelerators	Alexander Scheinker, LANL
DMA – Data Management and Analysis, the new Topic in MT	Michael Bussmann, HZDR

Speed Talks and Poster Session, Tuesday evening

Whole day Wednesday, June 13	
ST1 – ST4 science talks, dedicated ARD sessions (mixed)	

Morning Session Thursday, June 14	
Dedicated Diagnostics for Wakefield Accelerators – Perspectives	Mike Downer, U Texas
LEAPS – European Light Sources Technology Roadmaps for Detectors, Accelerators, Information Technology	Hans Braun, PSI

Symposium “90 Years of RF Accelerators” in Aachen

In 1927 Rolf Wideröe completed his seminal doctoral thesis in Aachen, Germany. 2017 was the 90 year anniversary of the first linear RF accelerator, constructed by Wideröe in Aachen, and of his visionary idea for a circular accelerator.

DESY and RWTH Aachen invited to a high level symposium to mark this anniversary and the subsequent achievements in our accelerator community: Symposium "90 Years of RF Accelerators“ Commemorating the 1927 PhD of Rolf Wideröe at Aachen, Germany.

The half-day symposium celebrated this event with talks on the history and modern accelerators from the LHC to the XFEL and medical applications.

The participants also had a lively discussion on RF accelerators and future developments in the morning of the second day.






RWTH AACHEN UNIVERSITY

DESY

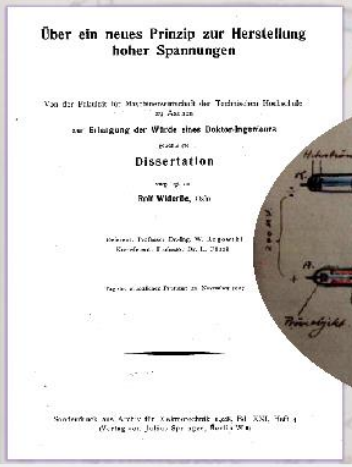
Symposium
“90 Years of RF Accelerators”

Commemorating the 1927 PhD of Rolf Wideröe

September 6th, 2017

at RWTH Aachen University, Germany

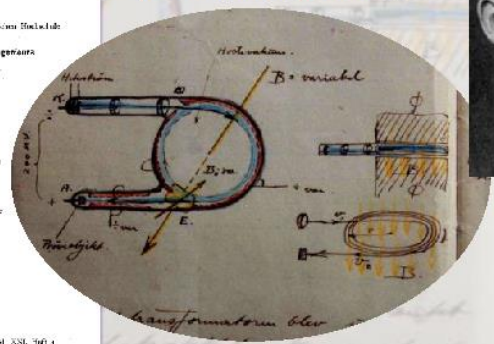
27 page PhD


Über ein neues Prinzip zur Herstellung hoher Spannungen

Dissertation

Rolf Wideröe

Idea circular accelerator (“Strahlentransformator”)




Rolf Wideröe

https://90years-rf-accelerators.de/

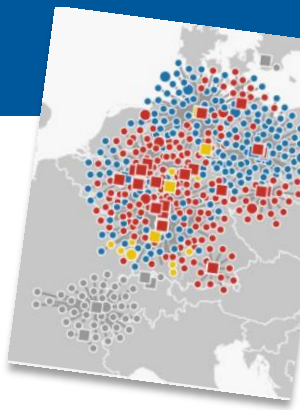
Organization Committee
Ralph Aßmann (DESY, Hamburg)
Andreas Lehrach (RWTH, Aachen)
Achim Stahl (RWTH, Aachen)

International Advisory Committee
Roy Aleksan (CEA, France), Mei Bai (FZJ, Germany), Ilan Ben-Zvi (BNL, US), Jörg Blaurock (GSI, Germany), Frederick Bordry (CERN), Reinhard Brinkmann (DESY, Germany), Andrea Ghigo (INFN, Italy), Norbert Holtkamp (SLAC, US), Andreas Jankowiak (HZB, Germany), Wim Leemans (LBNL, USA), Mats Lindroos (ESS, Sweden), Qing Qin (IHEP, China), Peter Ratoff (Cockcroft Institute, UK), Leonid Rivkin (PSI, Switzerland), Alexander Skrinsky (Novosibirsk, Russia), Vladimir Shiltsev (FNAL, US), Seiya Yamaguchi (KEK, Japan)

German Committee for Accelerator Physics

KOMITEE FÜR BESCHLEUNIGER-PHYSIK KfB

http://www.beschleunigerphysik.de/



Founded 2010
- 12 members (Universities, Helmholtz, Labs, International)
- elected by engineers and scientist,
  working in the field of accelerator physics (**420 registered**)
  = "Forum Accelerator Physics" ***(please register)***

1st period	2011 – 2013, Speaker Th. Weiland
2nd period	2014 – 2016, Speaker W. Hillert
3rd period	2017 – 2019, Speaker O. Boine-Frankenheim


Ralph Assmann
DESY
(Stellv. Vorsitz)


Oliver Boine-Frankenheim
TU Darmstadt
(Vorsitz)


Wolfgang Hillert
Uni Hamburg
(Vorsitz 2014- 2016)


Thorsten Kamps
HZB


Shaukat Khan
TU Dortmund


Andreas Maier
Uni Hamburg


Atoosa Meseck
HZB


Anke-Susanne Müller
KIT


Jens Osterhoff
DESY


Andreas Peters
HIT


Frank Tecker
CERN


Thomas Weiland
TU Darmstadt
(Vorsitz 2011-13)

Oliver Boine-Frankenheim, TU Darmstadt
Wolfgang Hillert, Uni Hamburg
Shaukat Khan, TU Dortmund
Andreas Maier, Uni Hamburg
Thomas Weiland, TU Darmstadt
Ralph Aßmann, DESY (co speaker)
Thorsten Kamps, HZB
Atoosa Meseck, HZB
Anke-Susanne Müller, KIT
Jens Osterhoff, DESY
Frank Tecker, CERN
Andreas Peters, HIT

German Committee for Accelerator Physics + AKBP

KOMITEE FÜR BESCHLEUNIGER-PHYSIK KfB

http://www.beschleunigerphysik.de/

Workshop: Perspectives in Radiation Sources (Photons, Neutrons, Ions)
26 – 27 April, 2018, KIT Karlsruhe
https://indico.scc.kit.edu/indico/event/415/overview

Prisma Dialogue Verbundforschung, BMBF + other committees, 06.06.2018

Verbundforschungs Workshop, 02.-03.09.2018, HZB Berlin

DPG

Arbeitskreis Beschleunigerphysik, DPG, Founded 2014
(AKBP = Working Committee Accelerator Physics)

Spokesperson: Atoosa Meseck, HZB / deputy: Kurt Aulenbacher, KPH / JGU Mainz

Annual DPG Spring Meetings 2018
Matter and Cosmos, 19.-23. March 2018, Würzburg
~ 96 contributions (thereof ca. 50-60% ARD related)

next DPH Spring Meeting 2019
Matter and Cosmos, 18.-22. March 2019, München

DPG Young Scientists Accelerator Physics and Technology Award

Arbeitskreis Beschleunigerphysik, DPG
(AKBP = Working Committee Accelerator Physics)

DPG Nachwuchspreis 2018

Der DPG Nachwuchspreis
Beschleunigerphysik 2018 geht an

Dr. Andreas R. Maier

in Würdigung seiner herausragenden, im Rahmen seiner Promotion und ersten Forschungsphase erbrachten wissenschaftlichen Leistungen bei der Weiterentwicklung der Laser-getriebenen Kielwellen-Beschleunigung in Plasmen. Die unter seiner Leitung aufgebaute Anlage LUX ermöglicht die Erzeugung von Röntgenstrahlung in Undulatoren mit Laser-Plasma-beschleunigten Elektronen und demonstrierte eine bei dieser Art von Beschleunigern bislang unerreichte Langzeitstabilität und Zuverlässigkeit. Seine Forschungsarbeiten umfassen wegweisende und innovative Ideen zur weiteren Verbesserung dieser Beschleunigungstechnologie und zielen auf die erstmalige Realisierung eines Freie-Elektronen-Lasers mit Laser-Plasma-beschleunigten Elektronen. Durch seine Arbeiten erwarb sich Herr Maier bereits nach einer relativ kurzen Forschungsphase ein international hohes Ansehen und eine große Wertschätzung. Seine Aktivitäten lassen weitere herausragende Forschungsergebnisse in näherer Zukunft erwarten.

Deutsche Physikalische Gesellschaft DPG

Sponsors:

DESY, GSI, HZB and CST Computer Simulation Technology AG, Pfeiffer Vacuum GmbH, RI Research Instruments GmbH

Young Scientists and Engineers in their early career (max. 5 years following PhD)

each year, 5000 €

Horst Klein Forschungspreis (Accelerator Physics)

Outstanding Scientist in the field of Accelerator Physics

Horst Klein-Forschungspreis 2018

Der Horst Klein-Forschungspreis 2018 geht an

Dr. Hans Weise

in Würdigung seiner herausragenden wissenschaftlichen Leistungen bei der Weiterentwicklung der supraleitenden Beschleunigungstechnologie für Linearbeschleuniger und Freie-Elektronen-Laser. Er war maßgeblich beteiligt am Aufbau und Betrieb des TESLA Testbeschleunigers bei DESY, aus dem die FEL Nutzeranlage FLASH hervorgegangen ist. Der unter seiner Leitung aufgebaute Beschleuniger der European XFEL-Anlage treibt die zurzeit weltweit leistungsfähigste Röntgenstrahlungsquelle und ermöglicht die Erzeugung hochintensiver, ultrakurzer, kohärenter Röntgenstrahlungspulse mit einer Wellenlänge bis hinunter zu 1 Angström in Pulszügen mit insgesamt bis zu 27.000 Einzelpulsen pro Sekunde. Die überaus erfolgreiche Inbetriebnahme dieser Anlage basierte auf einer mehr als 20-jährigen kontinuierlichen Forschungs- und Entwicklungsarbeit am Helmholtz-Zentrum DESY, bei der Hans Weise eine maßgebliche und tragende Rolle einnahm. Mit seinen Arbeiten hat Hans Weise weltweit Maßstäbe in der Entwicklung von supraleitenden Linearbeschleunigern für Freie-Elektronen-Laser gesetzt, die eine Vielzahl neuartiger wissenschaftlicher Experimente erst ermöglichen und damit auch von sehr großer Bedeutung für andere Bereiche der Physik sind.

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