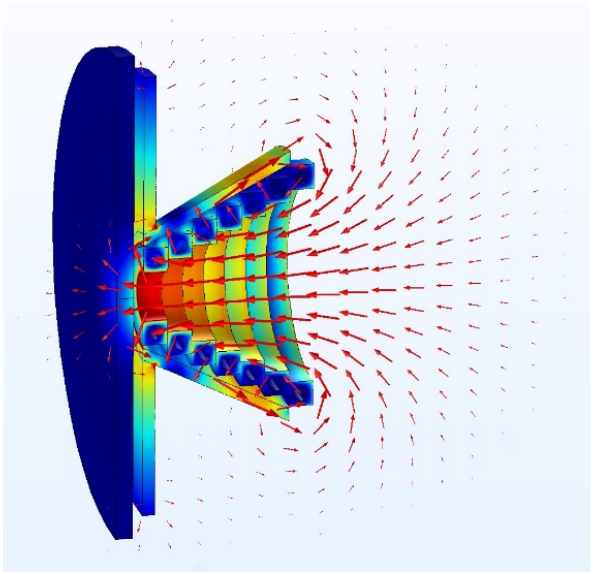
Some 'source' news

Ongoing activities:

- **Pulse solenoid**
- **Plasma lenses**
- **Target Tests**
- **German grant application**
- **Revive rotating wheel activities**
- **Plans**

OMD Design: Pulsed Solenoid

Tenholt, Loisch, Lemke,Sievers



- Design parameters:
  - ~50 kA peak current
  - 4 ms half-sine pulse + 1ms flat-top
  - 7 turns, linear taper (∅ 20mm → 80mm)
  - Peak field ~5 T
  - Average heat load on target: 73 W + 711 W
  - Peak force on wheel 612 N
  - Yield improvement compared to quarter-wave transformer
    - w/o shielding → ~70%
    - w/ shielding → ~ 55%
  - <1% focusing field variation in 1ms
  - Mechanical prototype design pending

OMD Design: Pulsed Solenoid

Tenholt, Loisch, Lemke,Sievers

- ITN Funding available for prototype design of pulsed solenoid
- Mechanical design department at DESY: available manpower for design
- Close iteration between CAD, magnetic field simulations & mechanical stress simulations planned
- Goal of development is a prototype solenoid to demonstrate
  - Magnetic field strength & distribution
  - Magnetic field stability
  - Mechanical stability of solenoid
  - Thermal stability (i.e. manageable heat load)
- Vacuum vessel not foreseen in first prototype design
- Start of mechanical design after summer
- still to be seen where tests will be done (DESY,CERN)

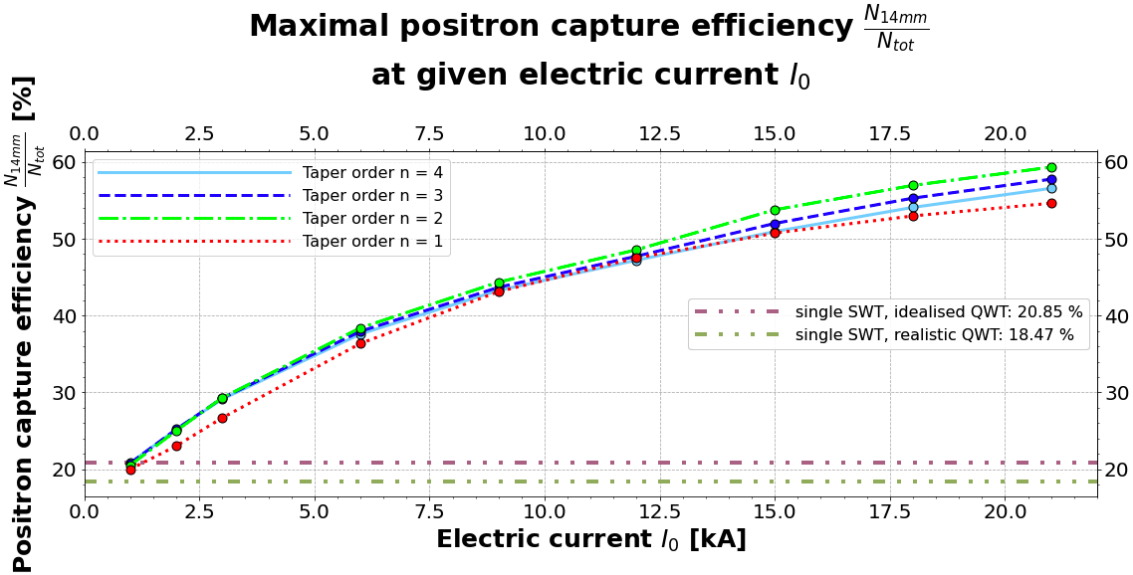
→ Overall goal: resolve open questions on mechanical feasibility

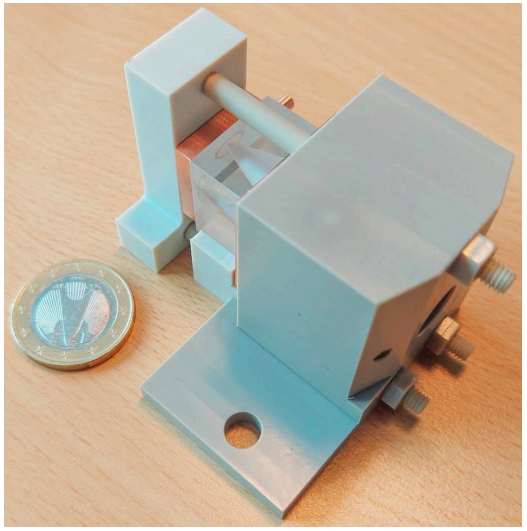
OMD Design: Plasma Lens

Formela, Hamann, Loisch

‘Future’: Plasma Lenses

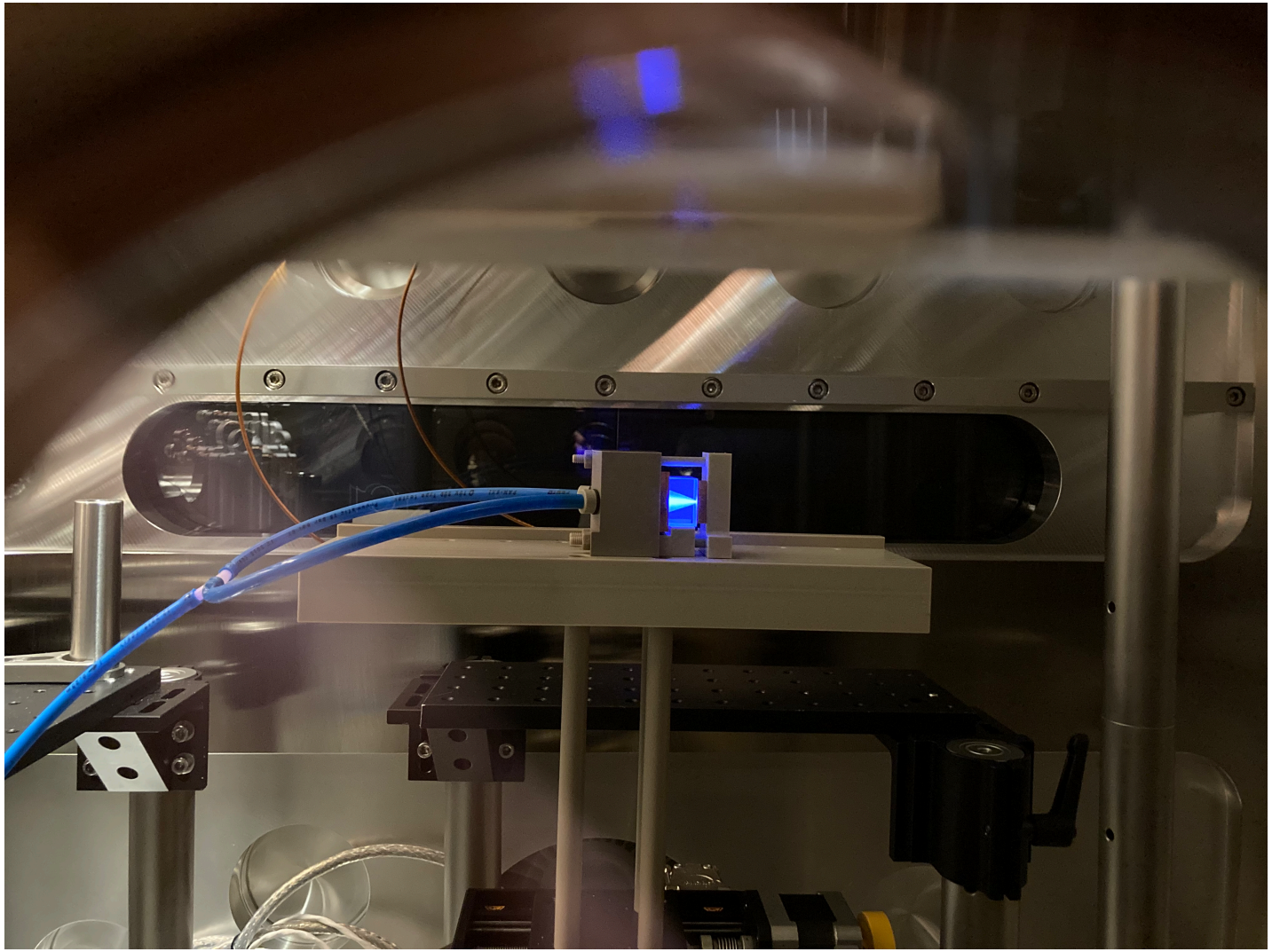
- increases e+ yield but increases load at target only slightly
- advantages in matching aspect
- downscaled prototype (factor 5) designed and produced
- first measurement start this month
- further grant application for full prototype





OMD Design: Plasma Lens

Formela, Hamann, Loisch



Analyses of ILC targets: continuing

- **target material tested at Mainz Microtron (MAMI) using e-**
  - **Done: electron-beam on ILC target materials, generating cyclic load with same/ even higher PEDD at target than expected at ILC**
  - **Several successful tests performed on Ti-Alloy**
  - **Further tests in 23**

A. *Ushakov*

T. Lengler, BThesis 2020

- **disentangling target damage originating from thermal vs radiation load**
  - **with dilatometer: targets at high temperature**
  - **fast and cyclic stress in the range of 400^0-800^0C**
  - **variation of T_{max} , heating rate, fixed T**
  - **very interesting results with α- and β- phase of Ti-alloy**

T. Lengler, MThesis 2023

- **Result confirmation: ILC undulator target will stand the load**

Grant Application

German BMBF grant application

- only every 3 years
- under the headings ‘Particles’
- ‘collaborative effort’…..together with other Universities+labs
- deadline was July 1st, 2023…
- usually too less money for too many projects….stay tuned
- first news probably end of the year

Plasma's for Particle Physics Applications

Hamburg+Bonn+Frankfurt+Karlsruhe+Mainz:

- 'full' scale prototype plasma lens for ILC
- test of lens at Mainz, need high pulse generators (Karlsruhe)
- 'full' simulation of e+ sources for ILC, HALHF
- simulation and testing of polarization transport in plasma
- generation of polarized plasma

Revive of rotating wheel activities

Try to reactivate rotating wheel effort:

- Meeting with Sabine Riemann, Peter Sievers, Ian Bailey, Jeff Gronberg, Phil Burrows, Andrew Lankford, Carmen+Gregor, Steinar and Steffen
- update of technical specifications under work (Peter&Steffen)
- maybe some ITN money for the wheel
- 2 Possibilties: a) get back 'old' wheel
  b) construct new prototype
- Needed: one lab that puts the hand up
- Maybe even something at DESY possible…..

➡ also needed for HALHF e+ source…..

➡ Oxford puts money in for HALHF

Plans

- ITN money provides a great opportunity to get R&D work done at DESY !
- Advanced work on design for pulsed solenoid
- Rotating wheel prototype design: simulations and efforts obgoing
  - revive UK spinning target for further mechanical tests?
  - new prototype and tests in vacuum?
  - cooling tests with target piece?
- Grant applications (BMBF) under way for full prototype plasma lens, simulation work on rotating wheel can be included
- Inclusion of e+ source for HALHF concept ….e+ source!
  - DESY+UHH: physics studies, tests at FLASHForward (plasma accel. stages, start-to-end sim.) and e+ source

➡ ***lots of activities ongoing,…although no official funding!***