Work Package 7

7.1: Accelerating structure development
7.2: Transfer structure development
7.3: Structure technology development

Walter Wuensch
CLIC Collaboration meeting
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Introduction

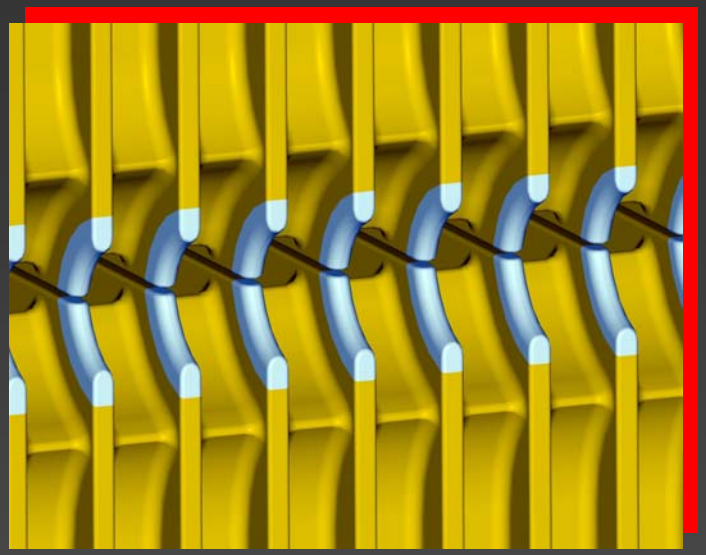
Two key feasibility demonstrations for CLIC include, TRC R1 issues,

- 560 MW power production by Pets
- 150 MV/m accelerating gradient

- at the full 130 ns pulse length and with prototype structures

Wp 7 is dedicated to developing design and technologies for power generating and accelerating structures

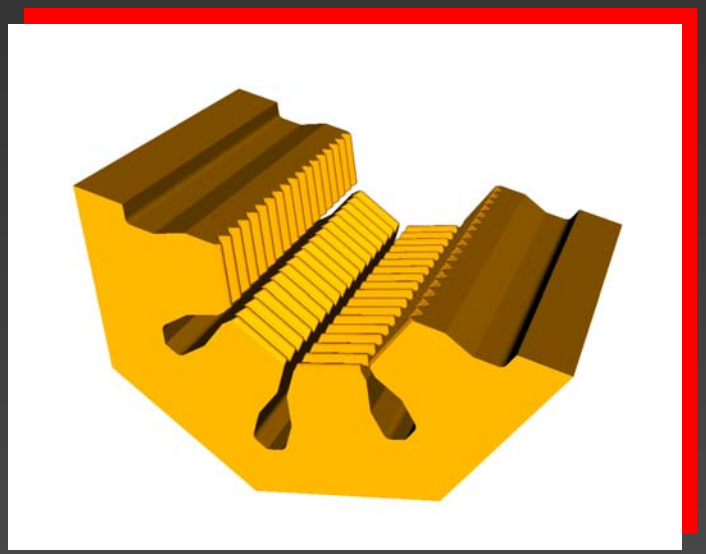
Work package 7.1: Accelerating structure development



High-efficiency, high-gradient, high-power, tight-tolerance, HOM-damped, long-lifetime structure.

- Development and integration of computational tools for structure design and optimization
- Improvement in understanding of rf breakdown, pulsed surface heating, tolerances, beam-dynamics, materials, manufacturing and synthesis into structure design
- Design of all rf and mechanical aspects of the structure including power couplers, damping loads, cooling etc.

Work package 7.2: Pets structure development



Unique, extreme high-power, highly overmoded, HOM damped, switchable structure.

- Highly integrated, parallel activity with accelerating structures with many issues, tools, solutions common with accelerating structures,s
- Additional: small-series (14) production of pets structures for 35A test beam line to be used in wp 6.

Work package 7.3

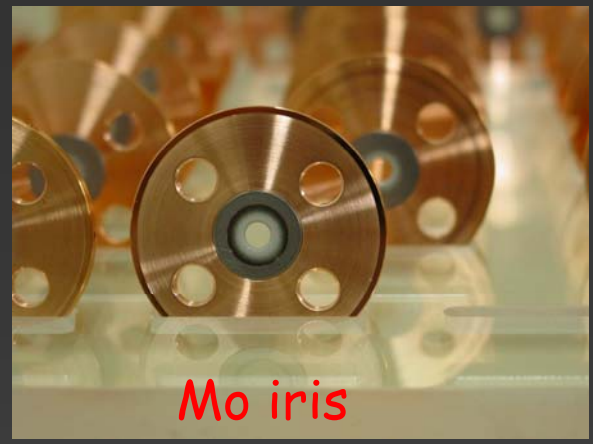
Structure technology development

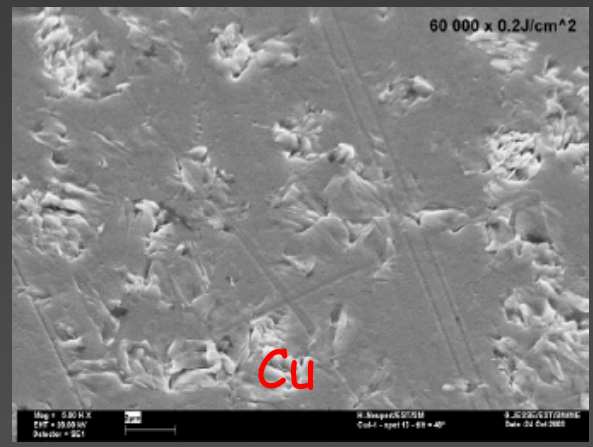
Investigate technological issues associated with new concepts,

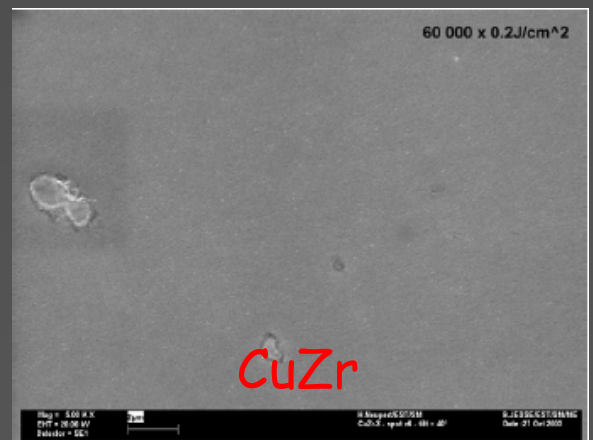
- the use of refractory metals in high electric field regions,
- the use of copper alloys, such as CuZr, in high magnetic field regions,
- assembly of structures in quadrants/octants rather than disks which requires ultra-high precision, multi-axis, three-dimensional milling and dimensional control.

Until now structures have mostly had circular geometries and been made from copper. Many issues, such as forming, joining, surface and vacuum preparation, must be adapted to the new materials.

All this must evolve as the testing program produces new results.







Work package 7.3 continued
Specialized structure-technology experiments

Objective: speed progress on material development and physical understanding by complimenting high-power rf tests, which are expensive, infrequent and often limited in time. Allows pre-selection of candidate materials, manufacturing and preparation techniques

Partial list, new proposals encouraged,

- a dc spark test
- a laser induced pulsed surface heating test
- an ultra-sonic fatigue test
- rf induced pulse surface heating

Preliminary cost estimate:

wp's 7.1 and 7.2: Budget allocated in CLIC program for test structures,
Participation needed in the form of, knowledge/concepts/designs

except in wp 7.2 supply of 14 pets structures, 2.5 MCHF, 7 my

Wp 7.3: 0.5 MCHF, 12 my
Participation needed in the form of, technology/demonstration pieces/pre-prototypes/prototypes…