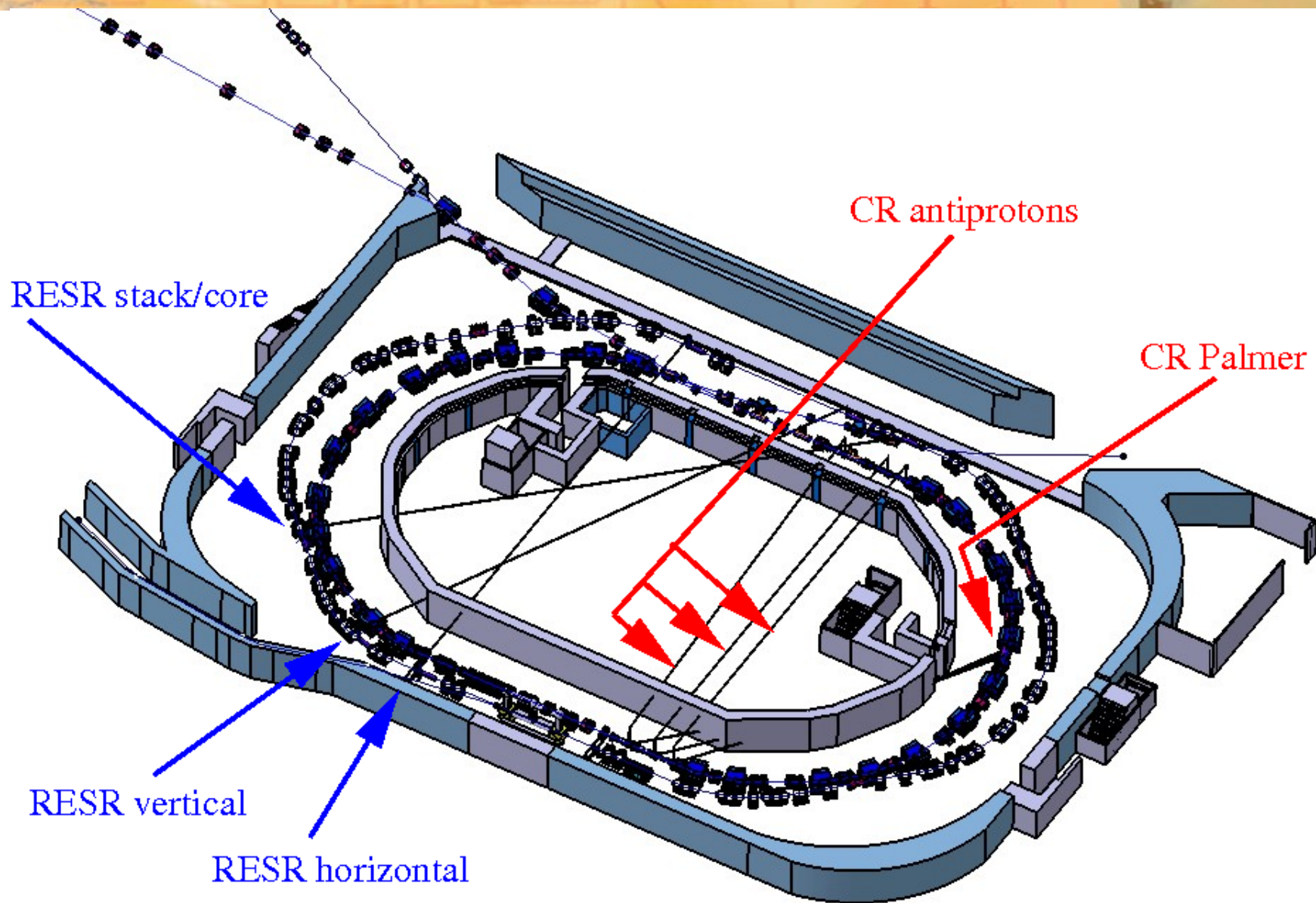


Stochastic Cooling CR

F. Nolden

CR and RESR Stochastic Cooling



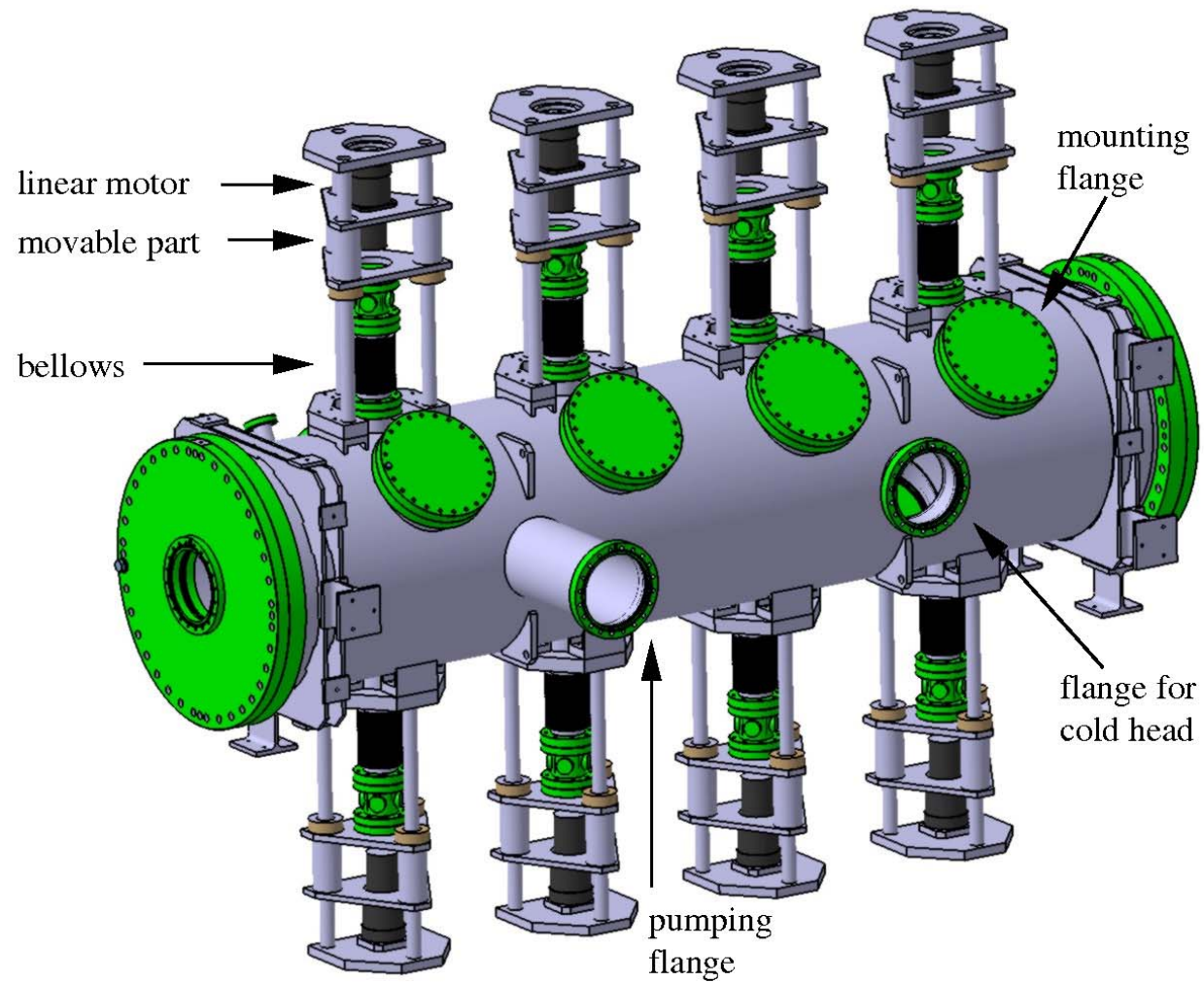
CR Beam Parameters

	antiprotons	rare isotopes
max. No. of particles	10^8	10^9
Injection energy	3 GeV	740 MeV/u
velocity	0.97 c	0.83 c
bunch length (injection)	50 ns	50 ns
$\delta p/p$ (injection)	$\pm 3 \%$	$\pm 1.5 \%$
$\delta p/p$ (cooled)	$\pm 0.1 \%$	$\pm 0.05 \%$
tranverse emittance (injection)	$240 \times 10^{-6} \text{ m}$	$200 \times 10^{-6} \text{ m}$
tranverse emittance (cooled)	$5 \times 10^{-6} \text{ m}$	$0.5 \times 10^{-6} \text{ m}$

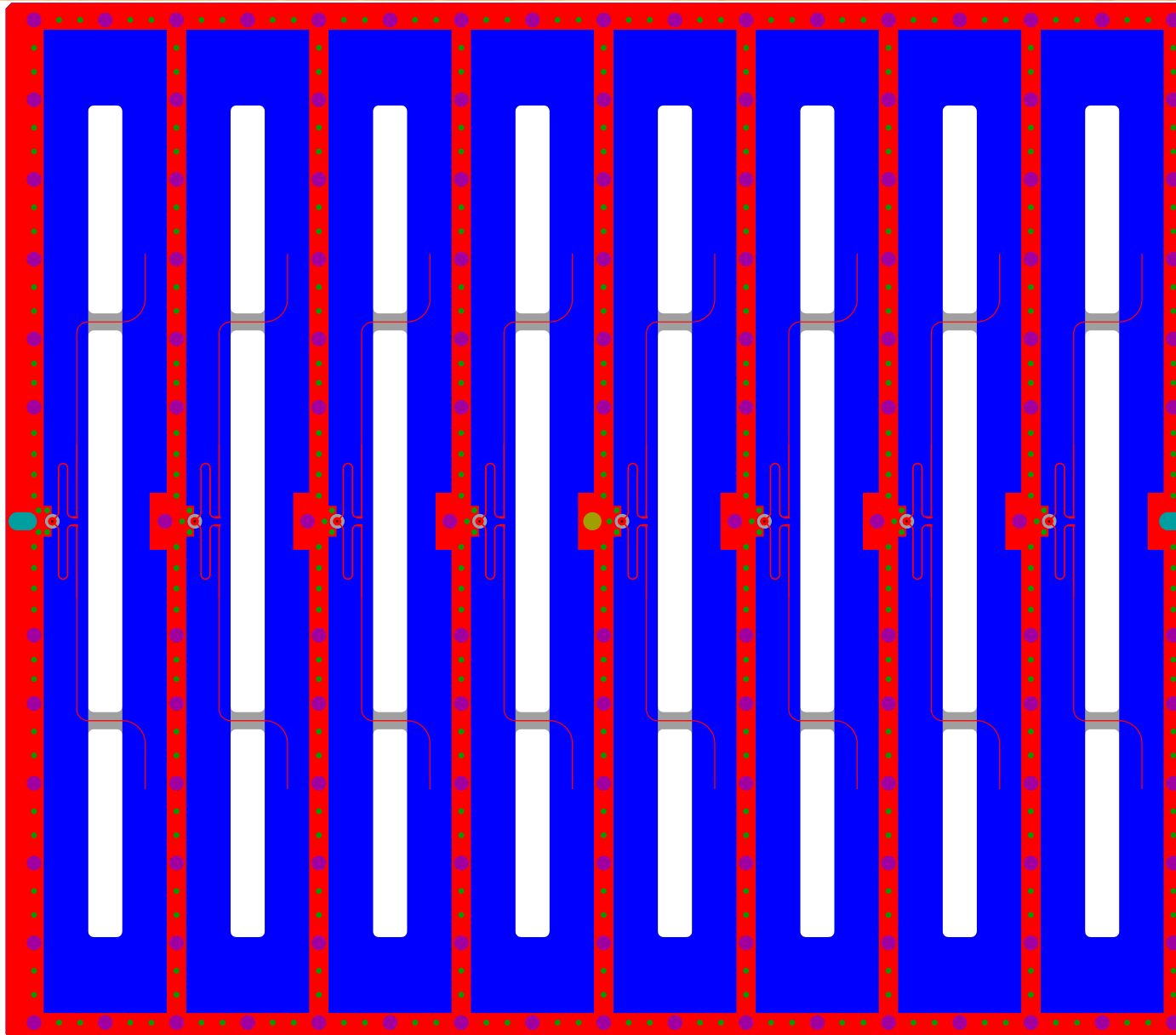
Main Achievements

- Final Definition of slotline structures
 - test support structure
 - electrode structure on Rogers material
- Design and construction of pick-up tank
 - to be delivered in Oct. 08
- Design of plunging mechanism
 - linear motors purchased and tested
 - accelerometry
 - programmable $s(t)$ (jerk free acceleration cycles)
- meaningful galvanization studies
 - gilded OFHC copper (thermal shield)
 - silvered CuBe foils (movable thermal conductor)
- power amplifier delivered
 - intense test measurements (microwave, water cooling etc....)

Prototype Tank

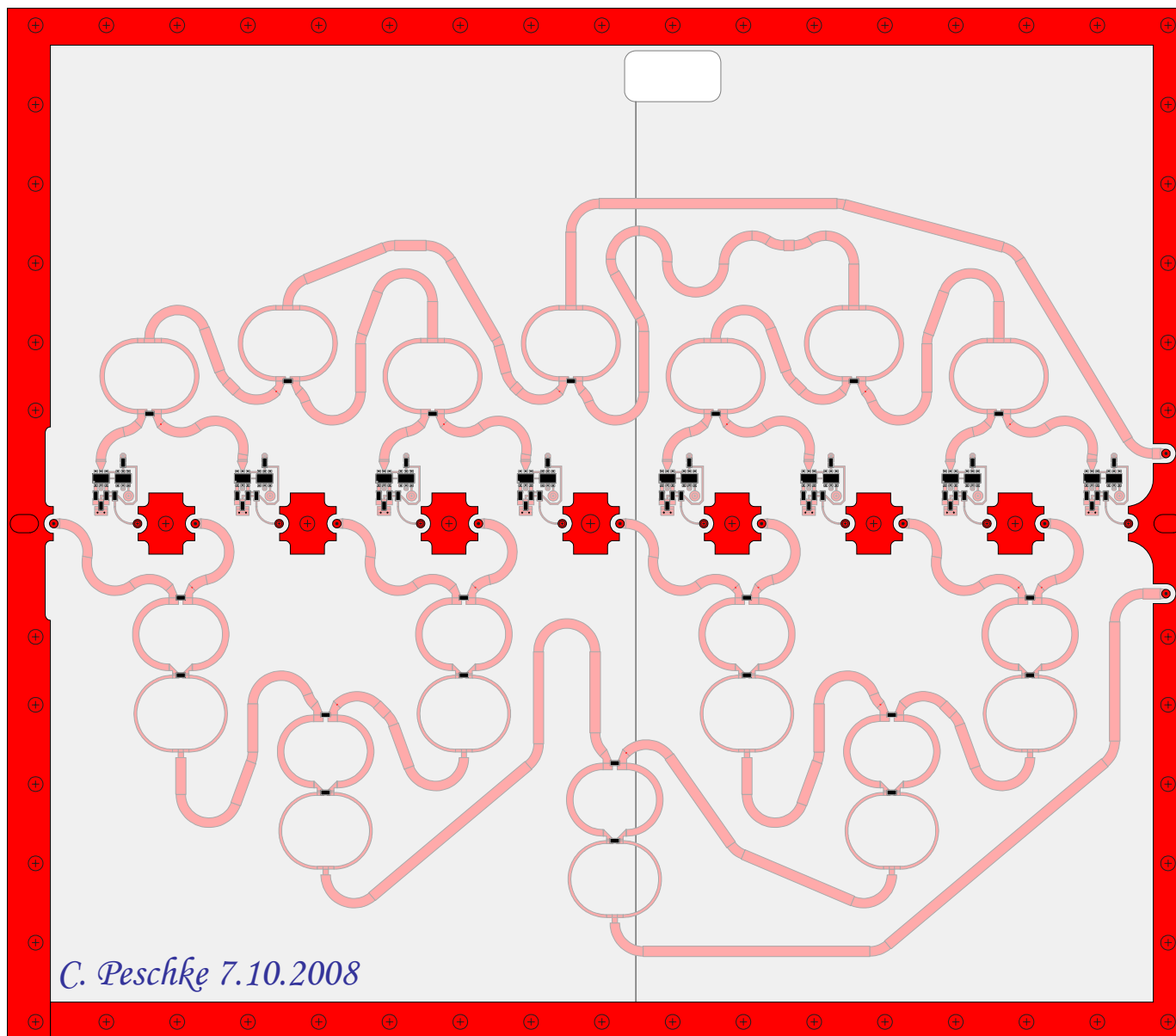


Slotline Pick-up



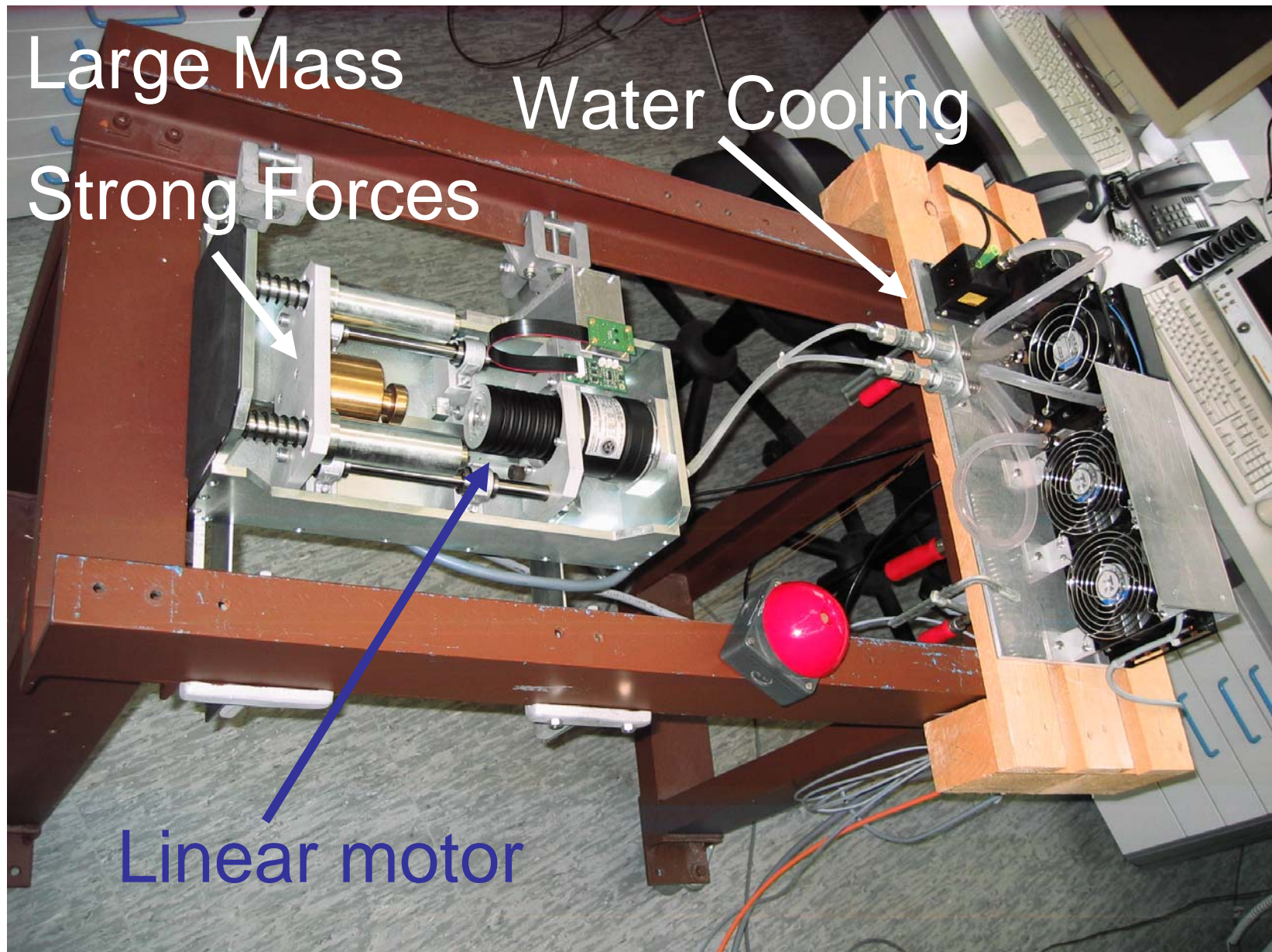
- Durchkontaktierung gefräst
- Durchkontaktierung \varnothing 3,2 mm
- Durchkontaktierung \varnothing 2,6 mm
- Durchkontaktierung \varnothing 1,0 mm
- Durchkontaktierung \varnothing 0,4 mm
- Oberseite Cu-Ni-Au
18 μ m
- Basismaterial Al_2O_3
1,905 mm
- Unterseite Cu-Ni-Au
18 μ m

Slotline signal combiner



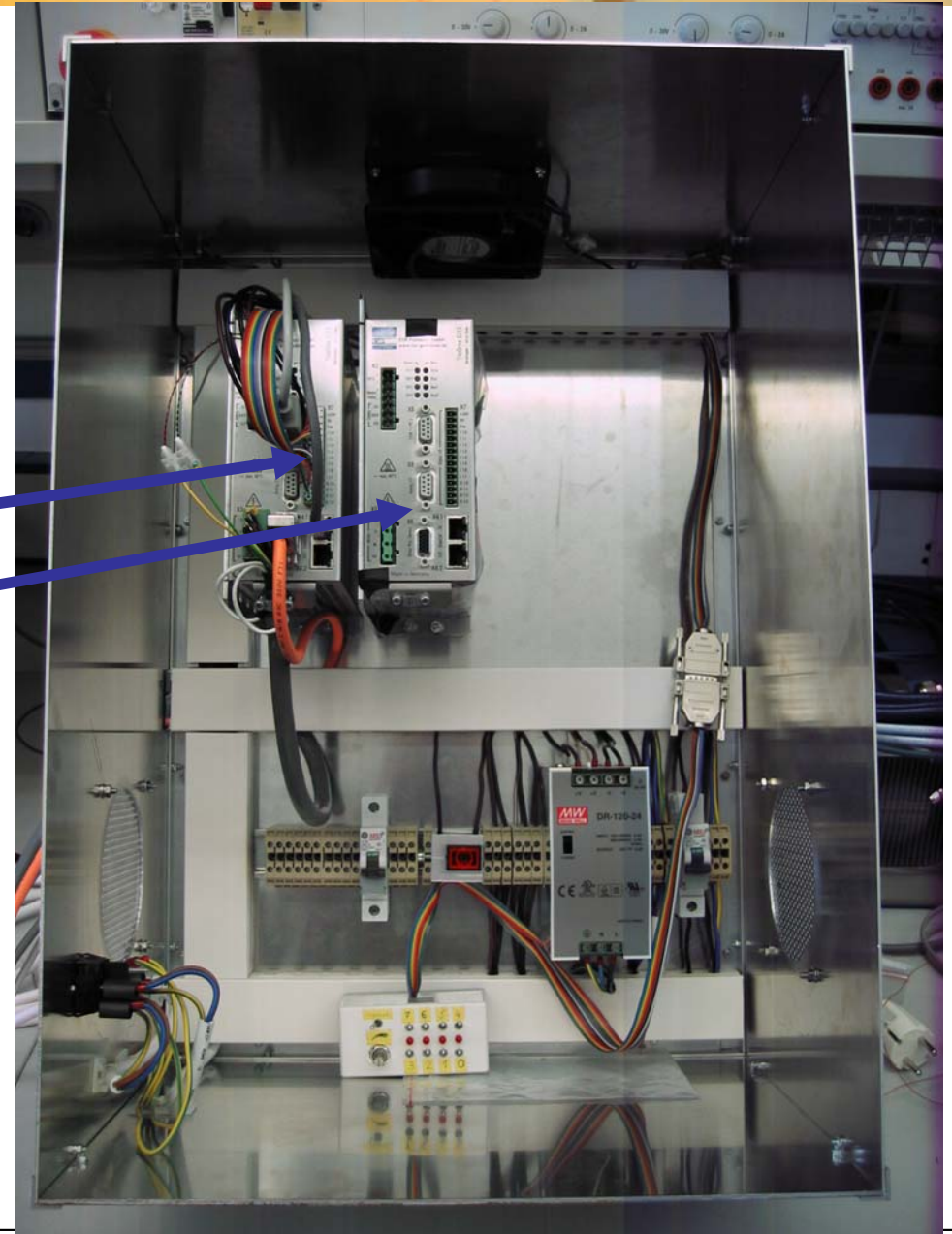
C. Peschke 7.10.2008

Mechanical test bench with linear motor drive



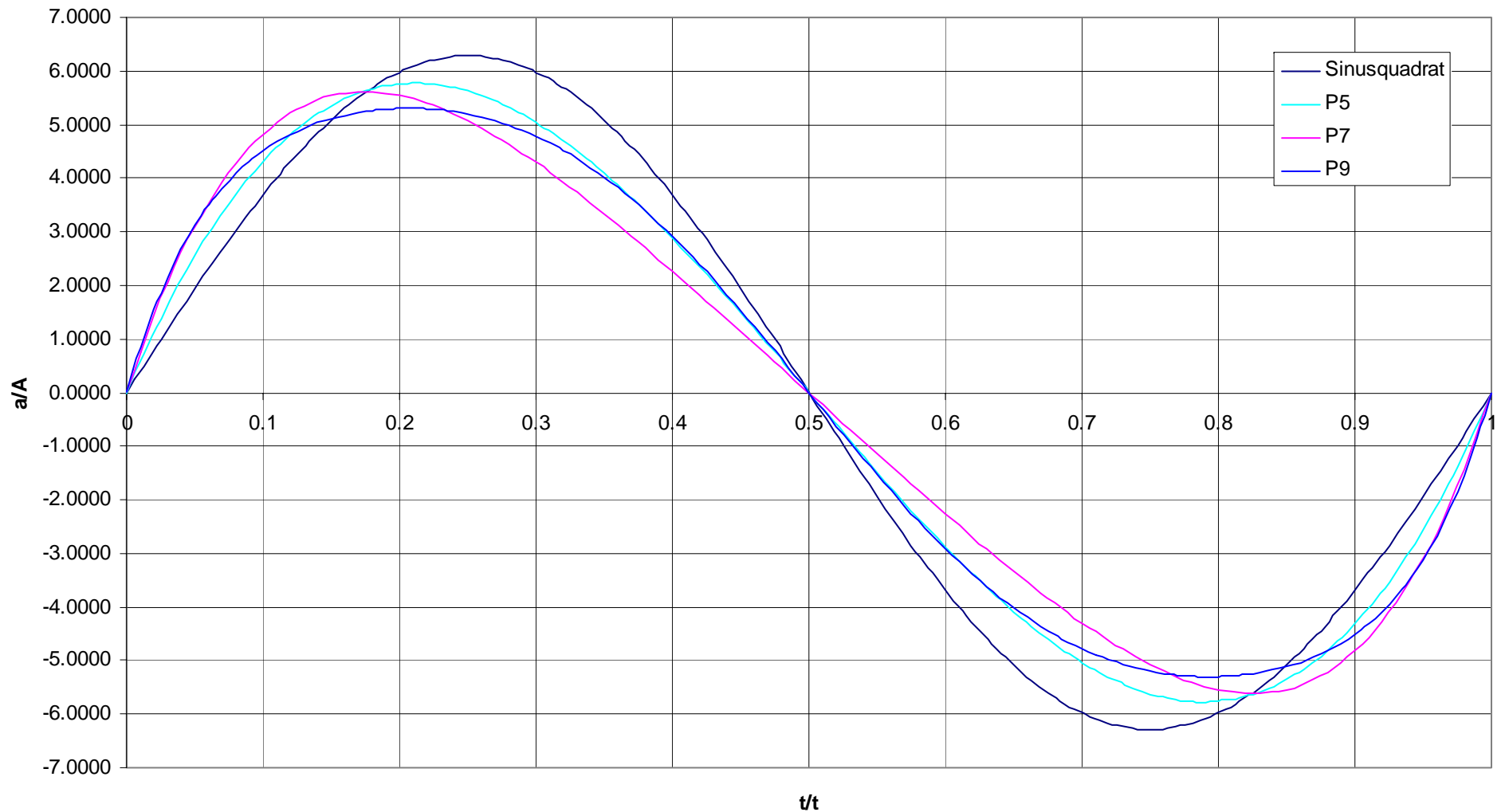
Electrical Steering Unit

Motor drive
steering units

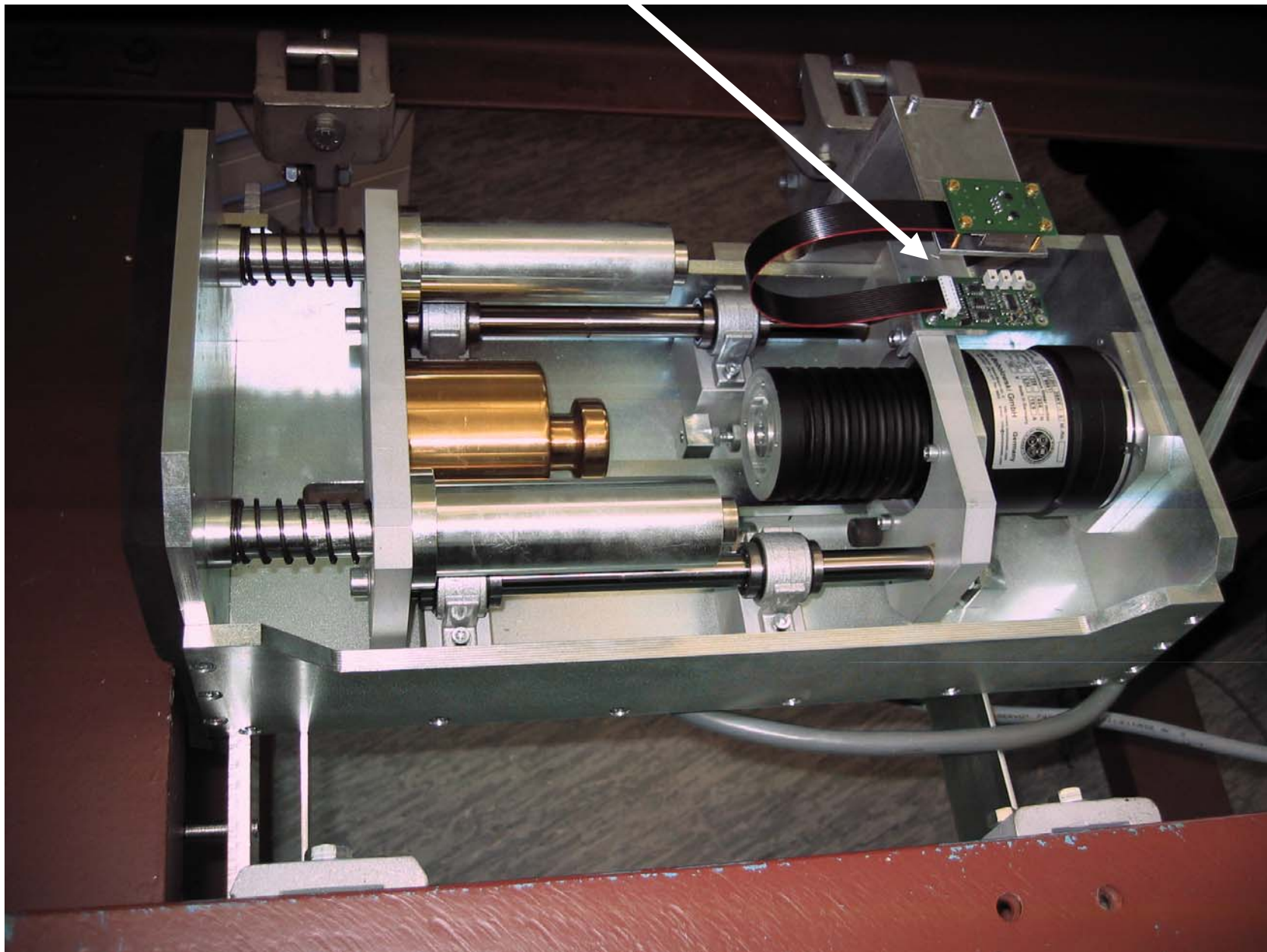


Potential jerk-free movements

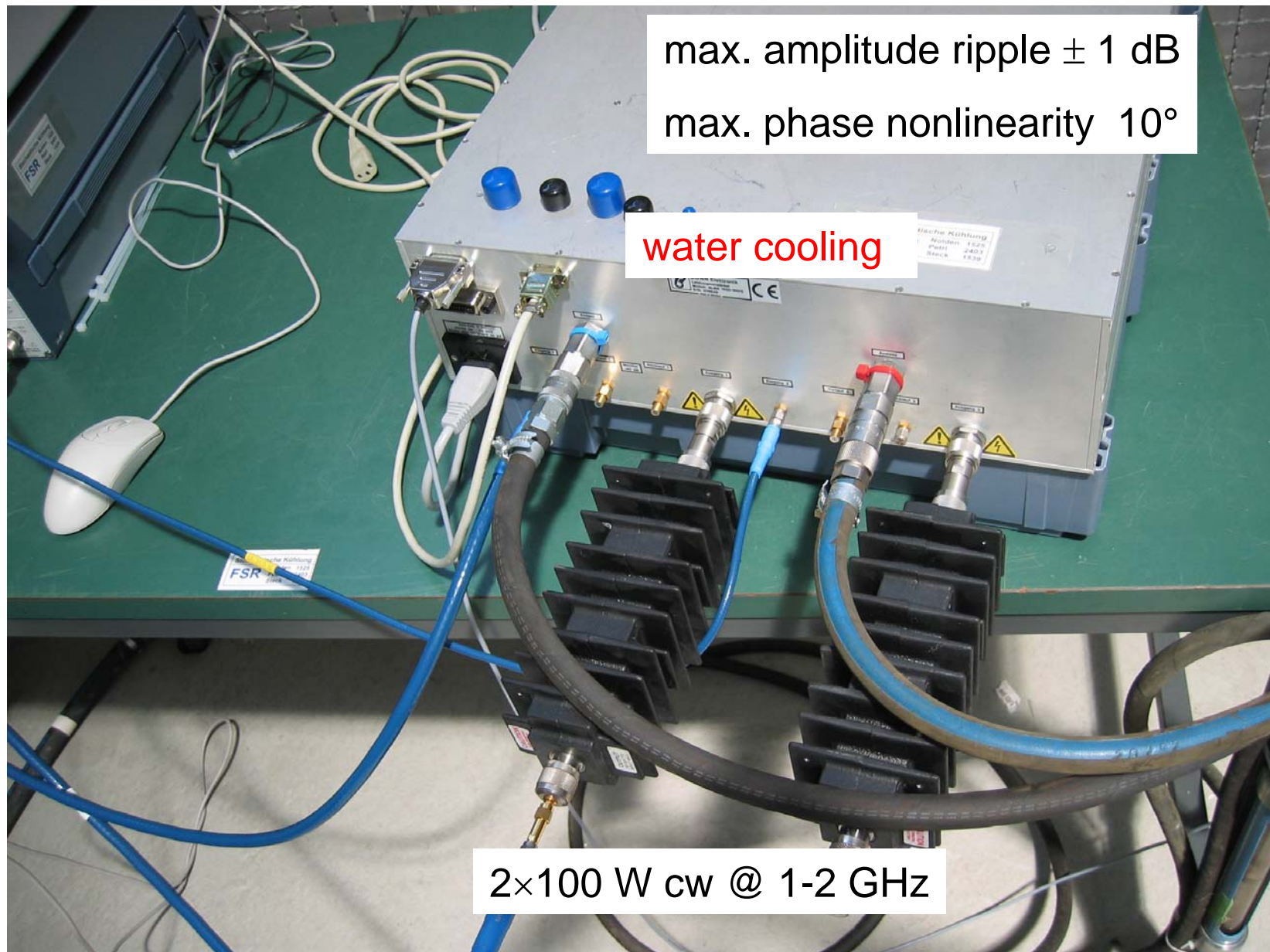
Beschleunigung



Accelerometer



Prototype Power Amplifier

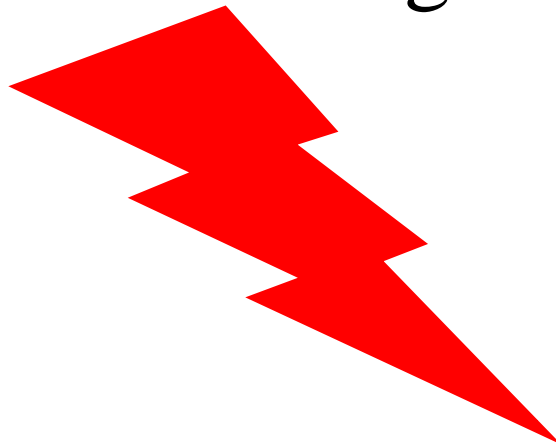


To-do List

- design and manufacturing of kicker tanks (2009-2010)
- cool tests of pick-up tank (2009)
- design and manufacturing of Palmer pu tank (2010-2011)
- power amplifiers (2009-2010)
- microwave electronics components (2009-2011)
 - phase stable attenuators
 - phase shifters
 - electrical length shifters
 - notch filters

Present Human Resources

- 1.5 physicists (C. Peschke, F. Nolden)
- 2.5 electrical engineers (S. El Hanaoui, R. Hettrich, P. Petri)
- 1 machine construction engineer (U. Jandewerth)



Hopefully: 1 physicist for simulation calculations