A few questions to discuss …

- Do we have the right R&D program ?
  What is missing ? What are the most critical items ?
- Basic R&D, are we doing enough, any magic on the horizon ?
- 12 GHz power source
- Power distribution and regulation
- What do you expect/need from CERN in order to participate ?

Tentative CERN x-band R&D program

When	Structure	Technology	Lab
Dec 2007	CLIC_vg1	quadrants, damped	CERN
	T26vg3MC	disks, brazed, undamped	SLAC/KEK
March 2008	CLIC_vg1	quadrants, undamped	CERN
	T26vg3MC	quadrants, undamped	CERN/SLAC/KEK
June 2008	CLIC_vg1	disks, brazed, undamped	CERN
	T26vg3MC	disks, brazed, damped	CERN/SLAC/KEK
2009	CLIC prototype	fully featured, best technology	CERN/SLAC/KEK

30 GHz program in CTF3

30 GHz will be used for fundamental studies of rf designs, preparation methods and materials

30 GHz:

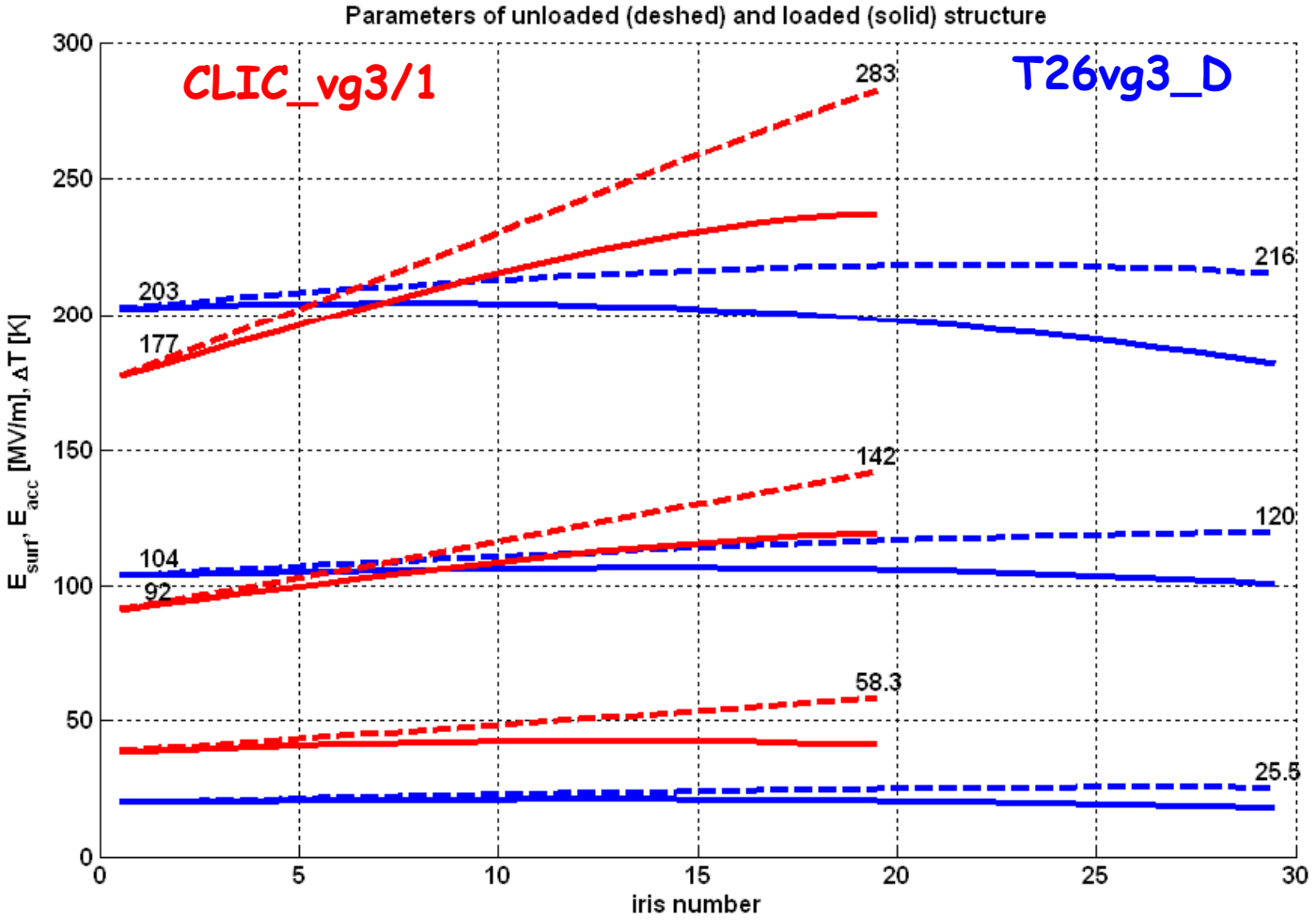
- pi/2 structure (test of short phase advance, fabrication tech.)
- HDS 11 copper/molybdenum (for better statistics)
- HDS 11 very small (r=1.2) (clear P/C experiment without other changes)
- Round 3.5 mm made out of quadrants (clear experiment for fab. Tech.)
- HDS4_150deg_thick_r=1.75 (iris thickness, phase advance, length, P/C)
- HDS4_150deg_thick_clean (compares cleaning with previous)
- NDS4_150deg_thick_r=1.75 (fab. Tech between HDS and NDS quadrants)
- NDS4_ 150deg_thin (iris thickness in comparison with NDS4_150deg_thick)
- Coupler test structure (not defined yet)

The two relevant geometries for the CLIC R&D program

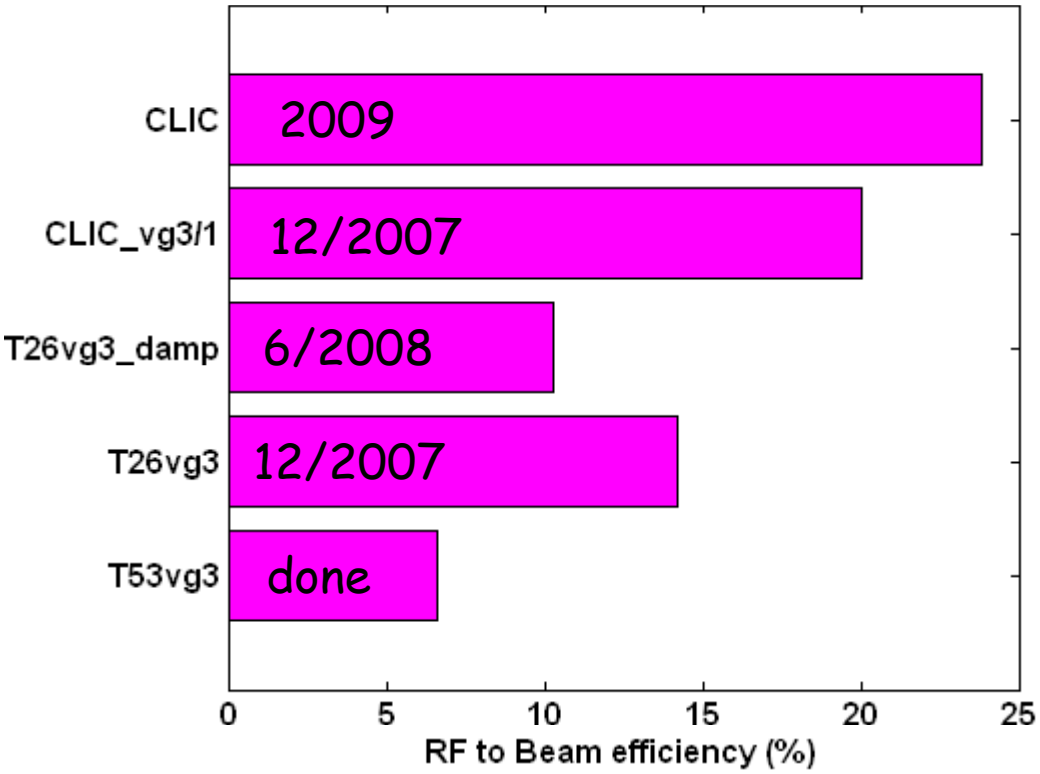
		CLIC	CLIC_vg1	T26vg3 damped
Frequency: f [GHz]		12	12	11.424
Average iris radius/wavelength: $\langle a \rangle/\lambda$		0.12	0.128	0.134
Input/Output iris radii: $a_{1,2}$ [mm]		3.87,2.13	3.87, 2.53	3.89, 3.17
Input/Output iris thickness: $d_{1,2}$ [mm]		2.66, 0.83	2.66, 1.25	1.66
Group velocity: $v_g^{(1,2)}/c$ [%]		2.39, 0.65	2.4, 0.95	2.86, 1.42
N. of cells, structure length: N_c, l [mm]		24, 229	18, 179	30, 265
Bunch separation: N_s [rf cycles]		8	8	8
Number of bunches in a train: N_b		311	359	66
Pulse length, rise time: τ_p		297	295	102
Input power: P_{in} [MW]		65	70	111
Max. surface field: E_{surf}^{max} [MV/m]		298	283	216
Max. temperature rise: ΔT^{max} [K]		56	58	25
Efficiency: η [%]		23.8	20	10.3
Bunch population: N		4.0×10^9	4.0×10^9	4.0×10^9

Parameters along the structures

CLIC_vg3/1 is more extreme in maximum surface field, pulsed heating and lowest group velocity



Efficiency milestones



P = 65 MW; 297 ns ⇔ nb = 311

P = 70 MW; 295 ns ⇔ nb = 359

P = 111 MW; 102 ns ⇔ nb = 66

P = 102 MW; 113 ns ⇔ nb = 93

P = 134 MW; 104 ns ⇔ nb = 27

100 MV/m loaded, 10^{-6} break down rate, qb=$4*10^9$,
8 rf period bunch spacing, P*pl/C = 18 Wue