Laser Driver

Features

- Energy >TeV ($7B for a TeV Collider)
- Good emittance
- Overall efficiency(wall to beam) ~10%
- Repetition Rate ~ 15kHz
- Pulse duration ~100fs
- Beam Average power 15MW

Efficiencies
CLIC vs. Laser-Plasma

	CLIC	Laser Plasma (Fiber-based)
AC to RF/Laser	40%	40%
RF/ beam, Laser to beam	24%	20%
AC to beam	9.6%	8%

CLIC based on TBA (Two-Beam Acceleration)

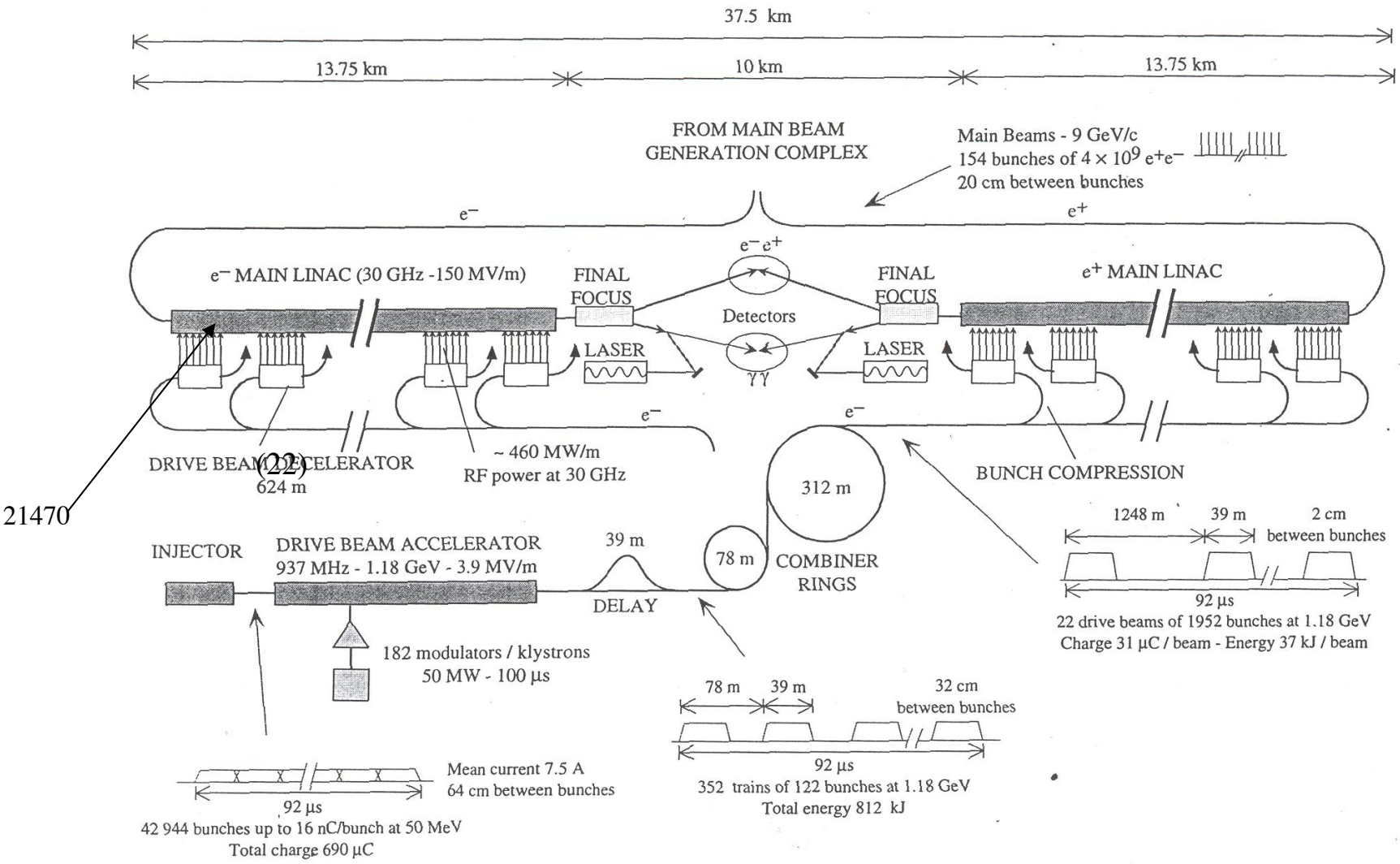

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Fig. A.1: Overall layout of the CLIC complex at 3 TeV centre of mass.

PETS Power Extraction and Transfer structures)

CLIC Characteristics

Energy of each electron pulse

E_p= 1.5TeVx4 10^9electronsx1.6$10^{-19}$C =1kJ

E_p=1kJ

Energy of each Pulse

E_{op} = [Efficiency(20%)]$^{-1}$x E_p(1kJ)

E_{op}=5kJ

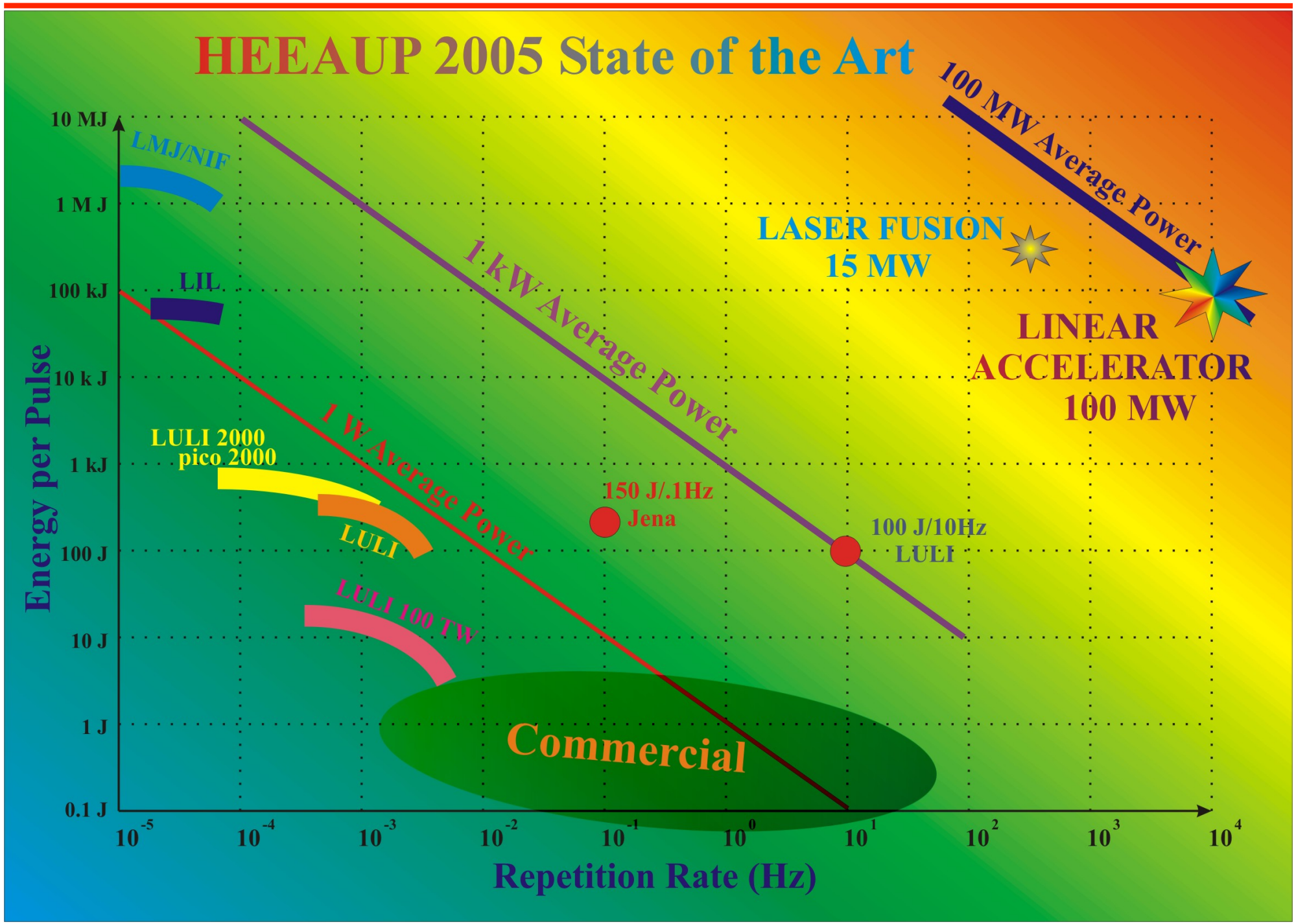
Peak Power P_p= E_{op}(5kJ)/.1ps

P_p= 50PW

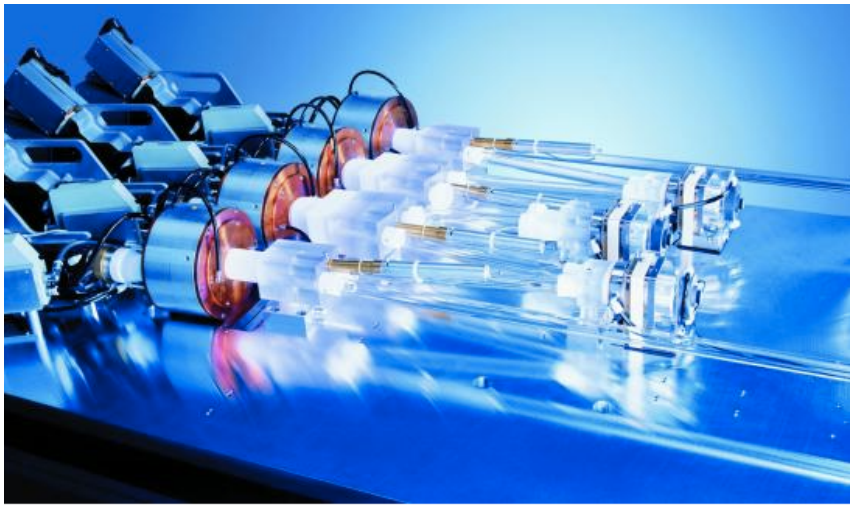
Average Power for two beams

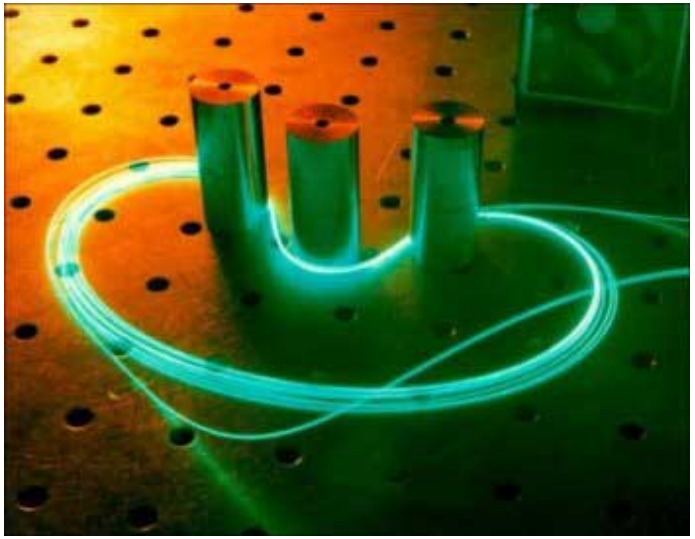
P_{AV}=2xE_{op} (5kJ)xRep.RateN(15kHz)

P_{AV}=150MW


HEEAUP 2005 State of the Art
100 MW Average Power
1 kW Average Power
1 W Average Power
LMJ/NIF
LIL
LULI 2000
pico 2000
LULI
LULI 100 TW
LASER FUSION
15 MW
LINEAR
ACCELERATOR
100 MW
150 J/.1Hz
Jena
100 J/10Hz
LULI
Commercial
10 MJ
1 M J
100 kJ
10 k J
1 kJ
100 J
10 J
1 J
0.1 J
Energy per Pulse
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
10^{4}
Repetition Rate (Hz)

Driver Technologies for High Average Power Laser





Thin Disk
J. Speiser

Fiber Amplifier
M. Somehk

Ceramics
K. Ueda

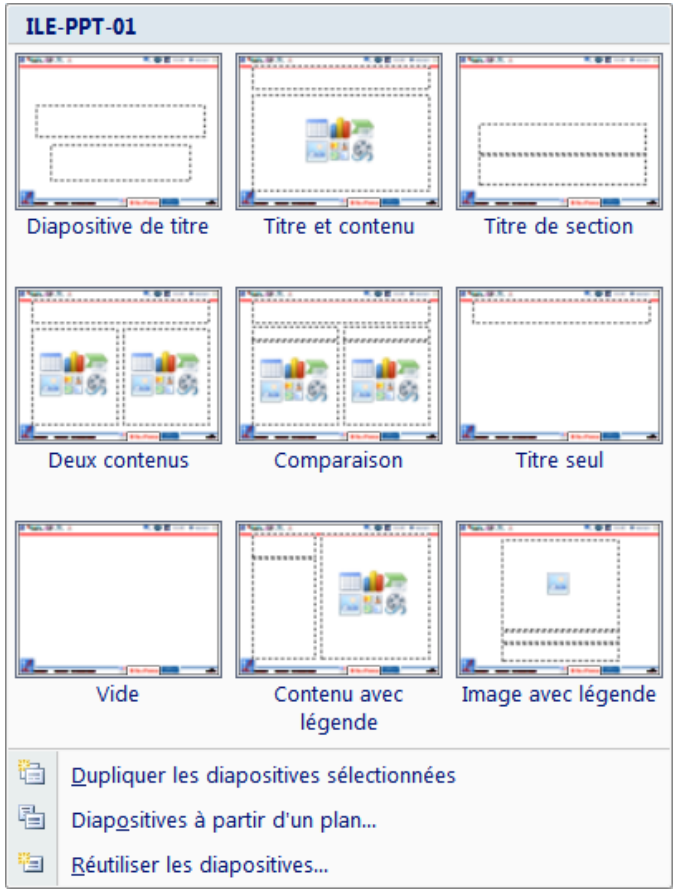
Laser Technology

<u>Main Challenge:</u>

Can Fiber lasers provide enough energy for laser plasma generation?

Types de diapositives

- Il y a 9 types de diapositives
  - Insertion nouvelles diapositives et sélection du type de diapositive
  - Ou disposition



Pour modifier les champs

- WPxx et Prénom NOM
  - Affichage, masque des diapositives
- Date et numéro de diapositive
  - Sont automatiques