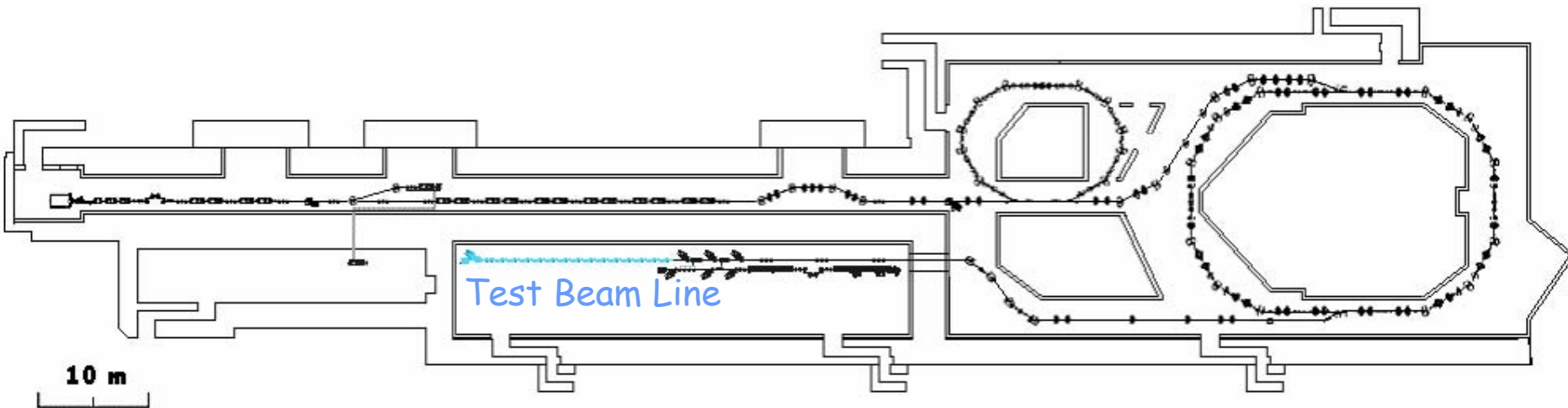


CTF3 WP6 - 35 A Test Beam Line (TBL)

- **Location**
- **Motivation**
- **Preliminary design considerations**
- **Boundary conditions**

TBL tentative location

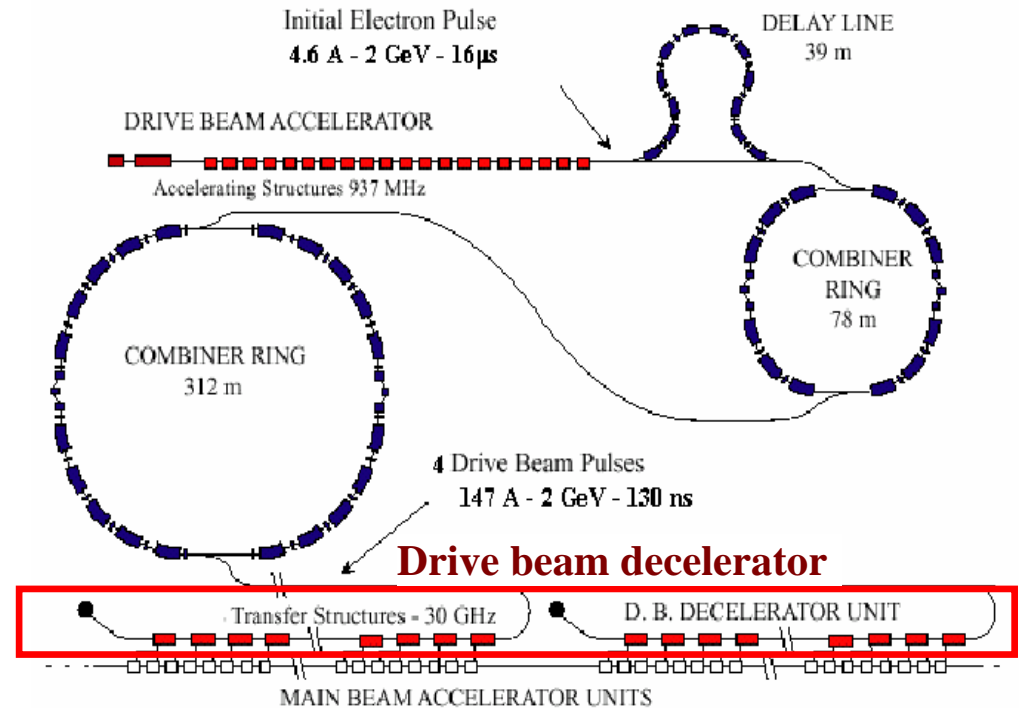


TBL motivation

Recommended R2 R&D issues for CLIC from the ILC-TRC report

(ILC-TRC=International Linear Collider – Technical Review Committee)

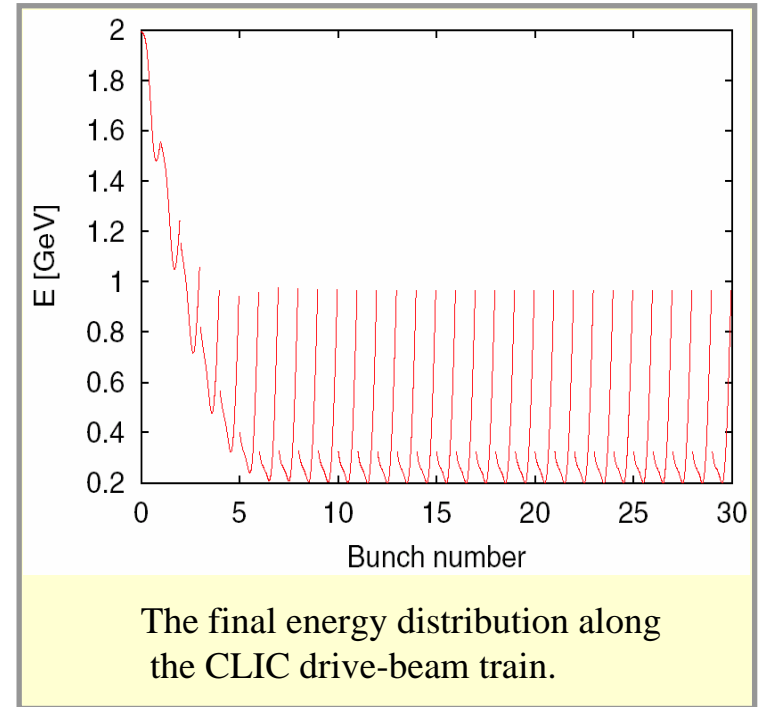
“The very high power of the drive beam and its stability are serious concerns for CLIC. The drive beam stability should be validated, and the drive beam Machine Protection System, which is likely to be a complex system, should be designed to protect the decelerator structures”



Main concerns for CLIC drive beam decelerators

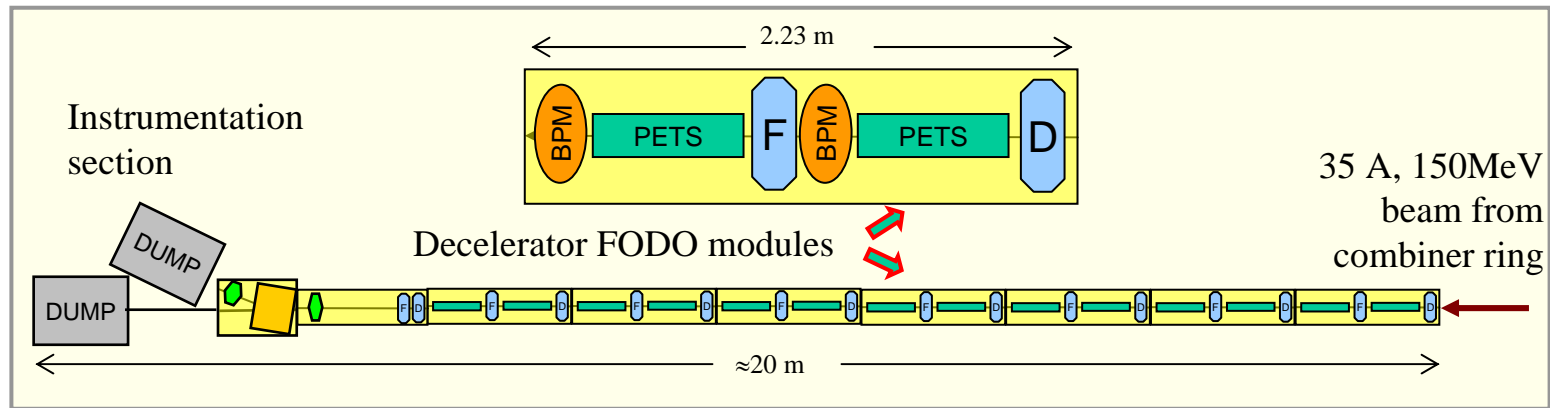
- **Beam of very high current and damage potential**
- **Total energy spread of up to 90%**
- **Considerable transverse wakefields**
- **Very different from any existing beams**

TBL as a scaled model of a CLIC drive beam decelerator allows to test operation and instrumentation for such a decelerator and to benchmark the predictive power of numerical simulation tools !



| <i>TBL tentative parameters comparison with CLIC decelerator</i> | | |
|--|------|------|
| | CLIC | TBL |
| Beam energy GeV | 2 | 0.15 |
| Beam current (A) | 147 | 35 |
| FODO period length (m) | 2.23 | 2.23 |
| Total length (m) | 624 | 20 |

Preliminary design considerations



Beam physics issues

- Study beam dynamics with same tools as used for CLIC (PLACET by Daniel Schulte)
- Choose in collaboration with WP7 (PETS) parameters which allow to reach unstable regime (because this will be the best test for predictive power of simulations)
- Assure good matching into TBL and sufficient resolution of downstream instrumentation
- Define & implement correction and feedback algorithms
- Define & implement machine protection strategy

Hardware needs per FODO module

- 2 Quadrupoles
- Quadrupole movers for steering
- 2 BPM
- Beam loss monitors
- Vacuum chamber and equipment
- 2 PETS with power measurement and RF load (provided by workpackage 7)

Instrumentation section downstream of TBL
Matching and Instrumentation upstream TBL
(t.b.d. how to share with WP 1, 2.2, 5)

Boundary conditions

Schedule: Has to be operational for spring 2008

Maximum length: \approx 30 m, determined by
CLEX building (L=40m)
and the layout of beamlines inside (not yet defined)

Resource estimate: 1.0 MCHF and 8 m*y
(very, very preliminary)