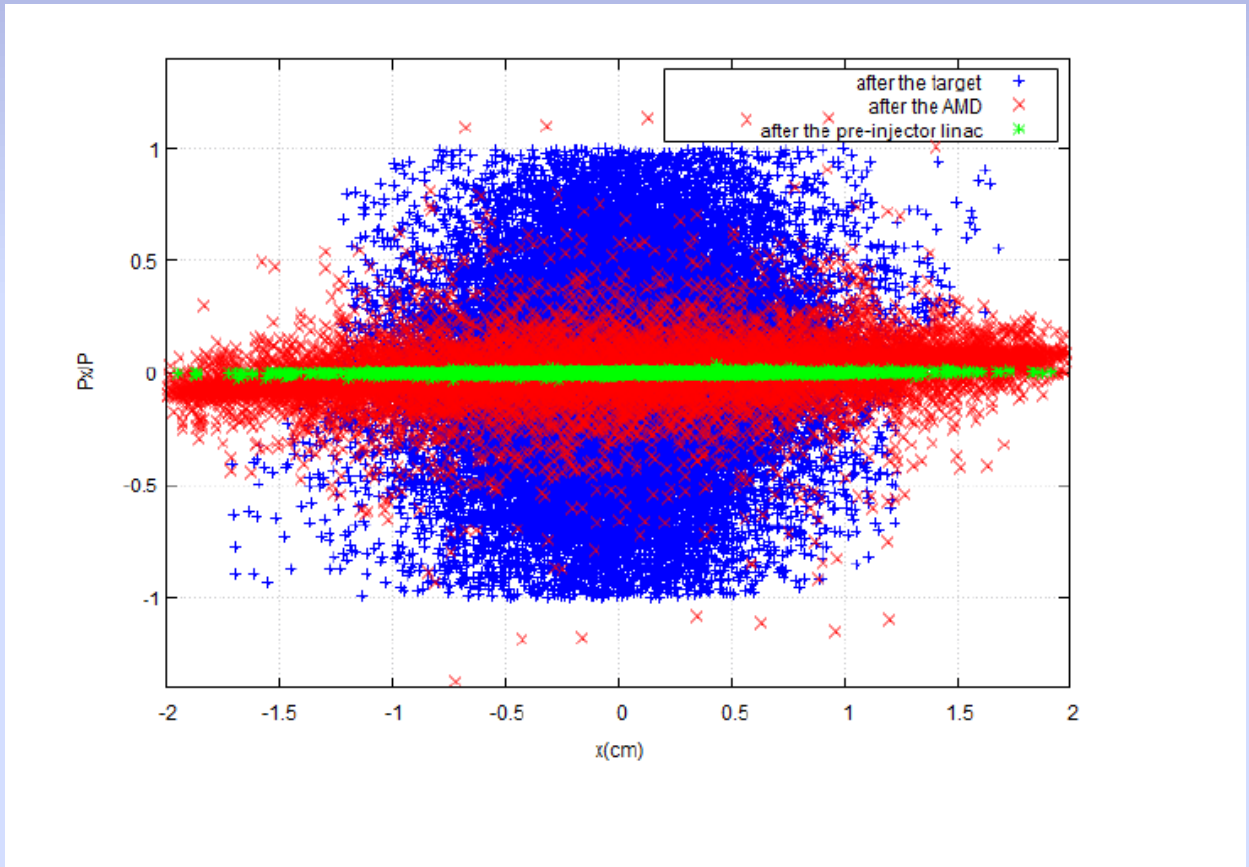
Status of the CLIC Injectors

- No changes to the electron injector
- Some work started on optimizing the positron source with a student started recently
- Continue to develop the drive beam injector front end, see LCWS 2013
- Some work on the new baseline for CLIC

Positron source

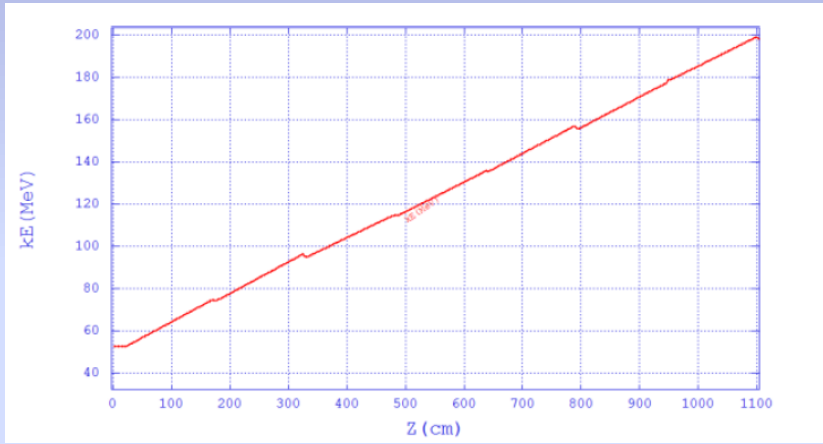
Plan to have for the first time consistent simulations from the target to the damping ring and optimize the positron yield.
New Student Cafer Bayar joint us very recently and started to work.

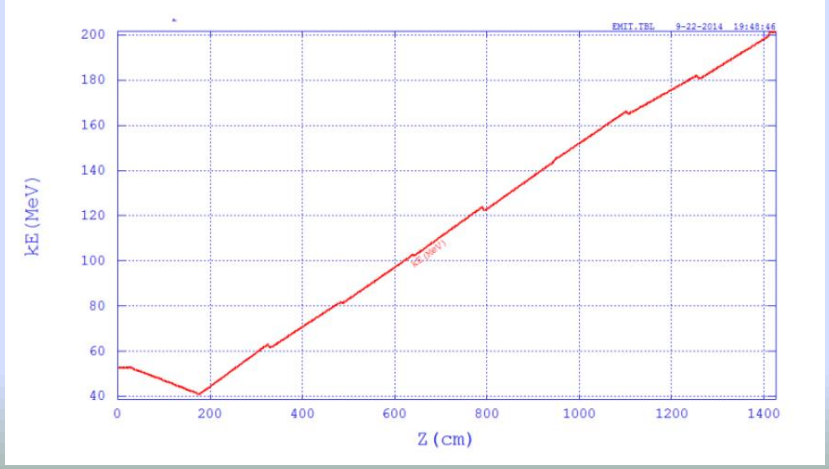


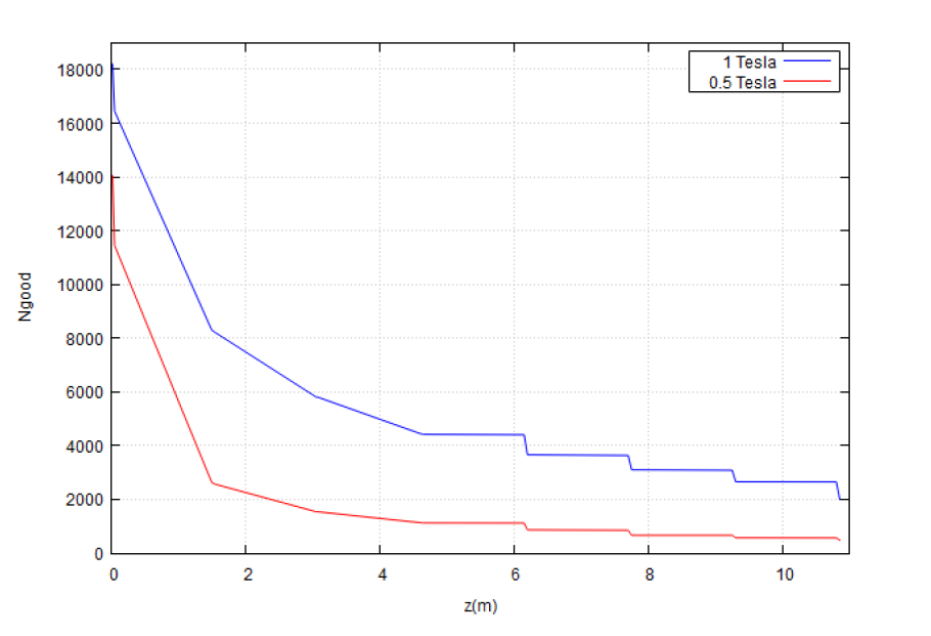
Phase space after target, after AMD and at the end of the 200 MeV pre-injector linac using CDR parameters

Positron source

Very preliminary studies, playing with acceleration and deceleration scenarios. Increasing the solenoid field to 1 T instead of 0.5 T seems to help a lot. Is it feasible, affordable ?

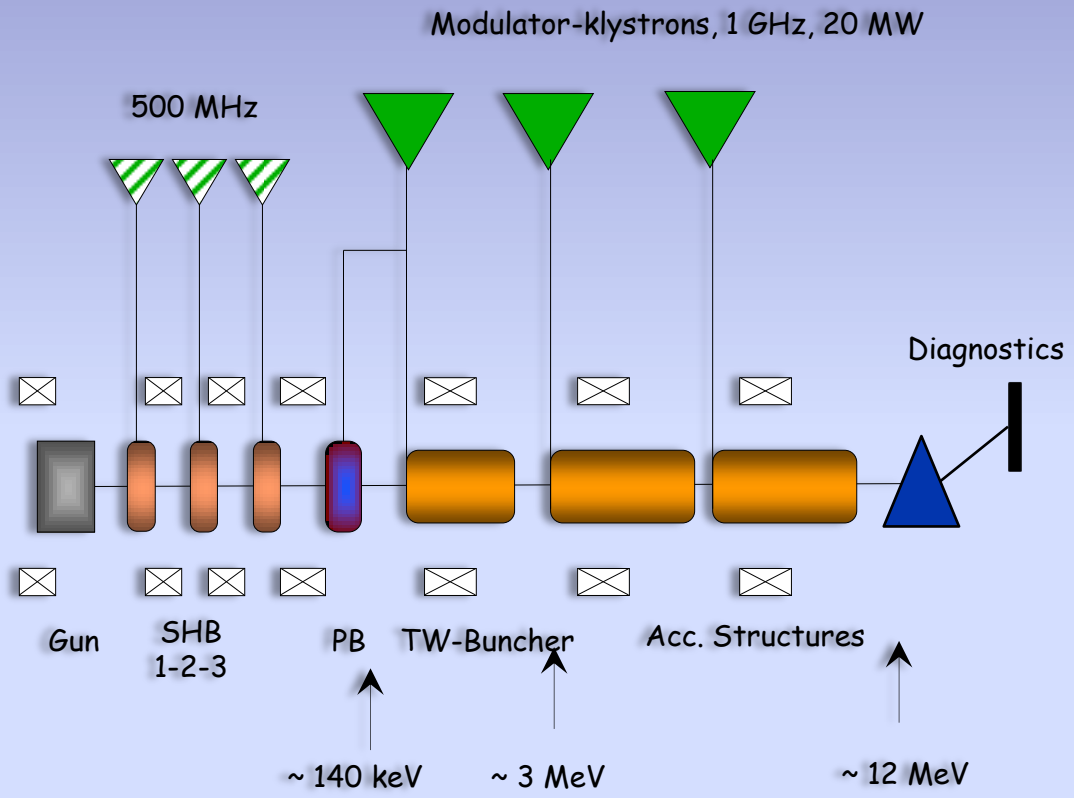






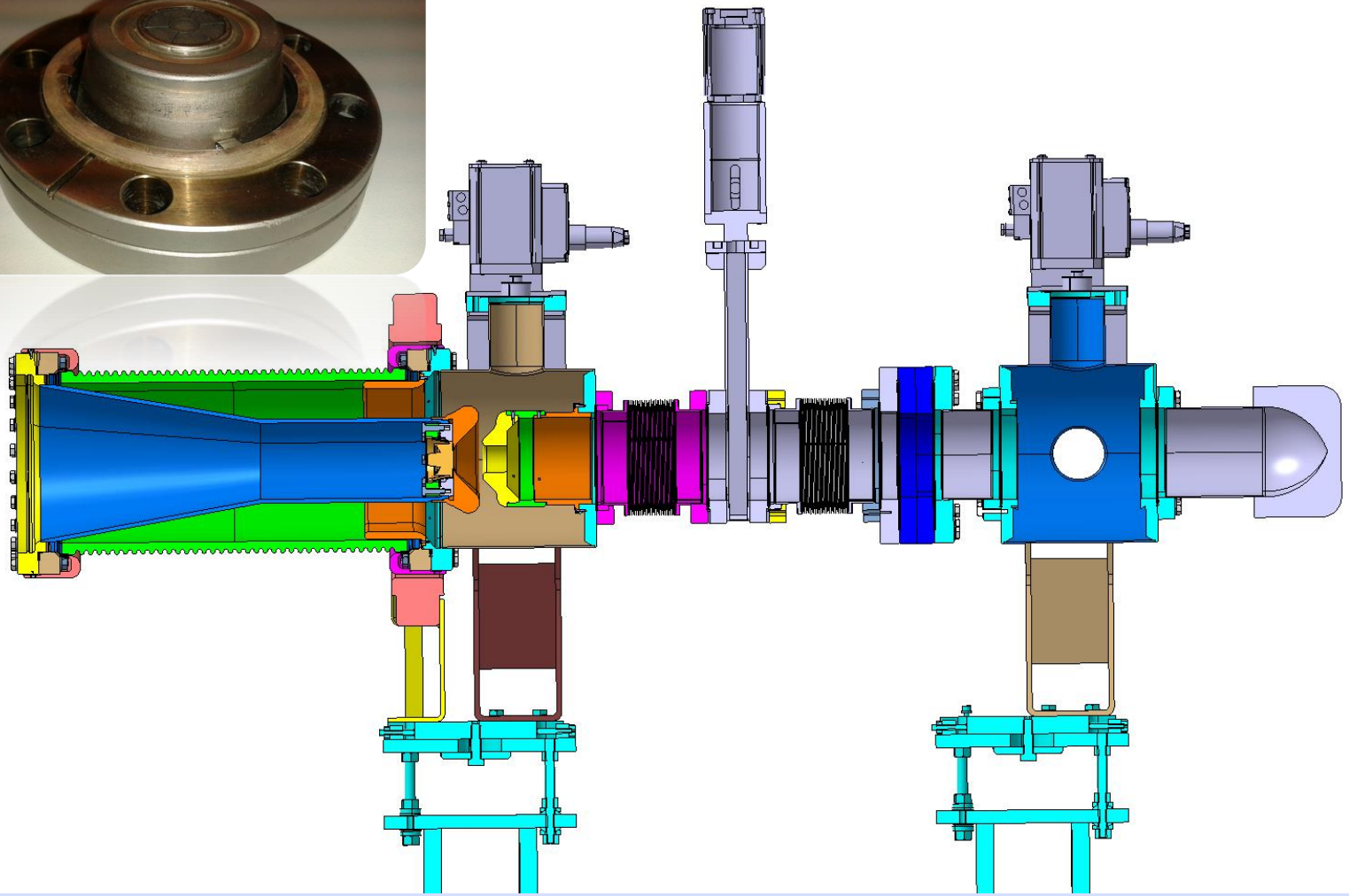
Cafer Bayar

CLIC DB front end, Post CDR Project



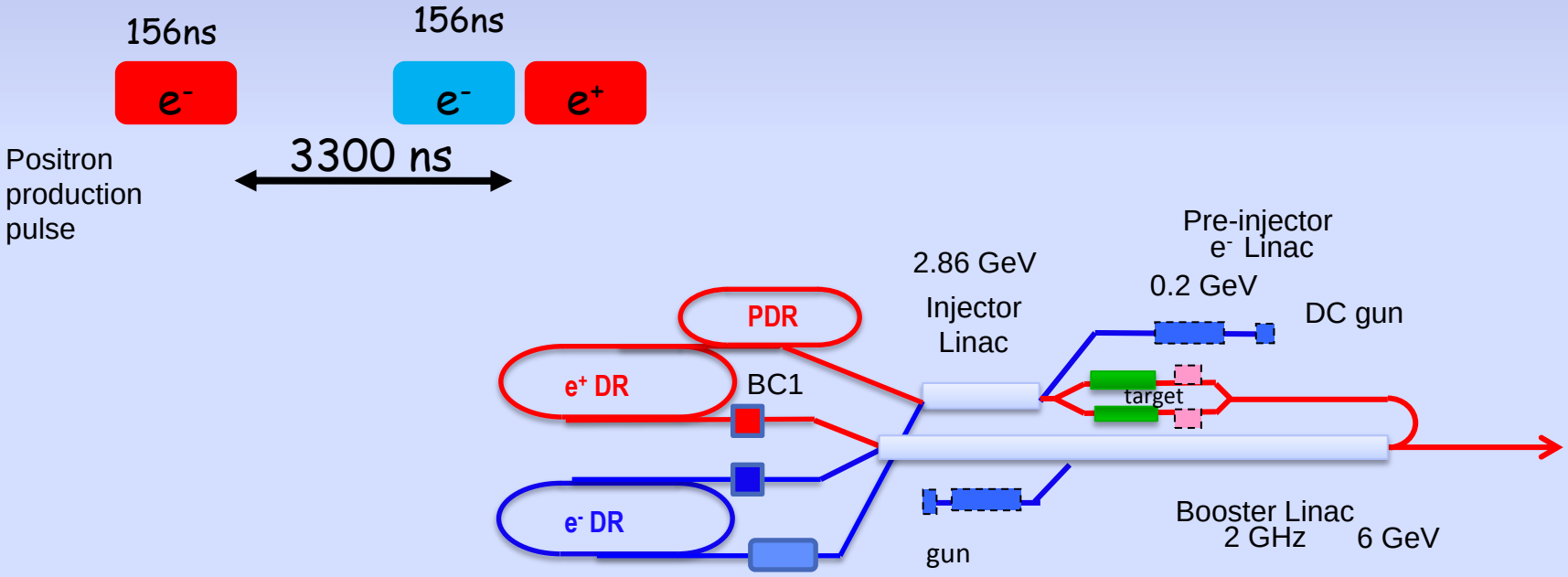
Major components under development, gun, SHB, PB, TW-Buncher
As well as power sources, up to 100 kW , wide band solid state source at 500 MHz and 20 MW L-band klystron with 70 % efficiency (two prototypes have been ordered with Thales and Toshiba)

Thermionic Gun design



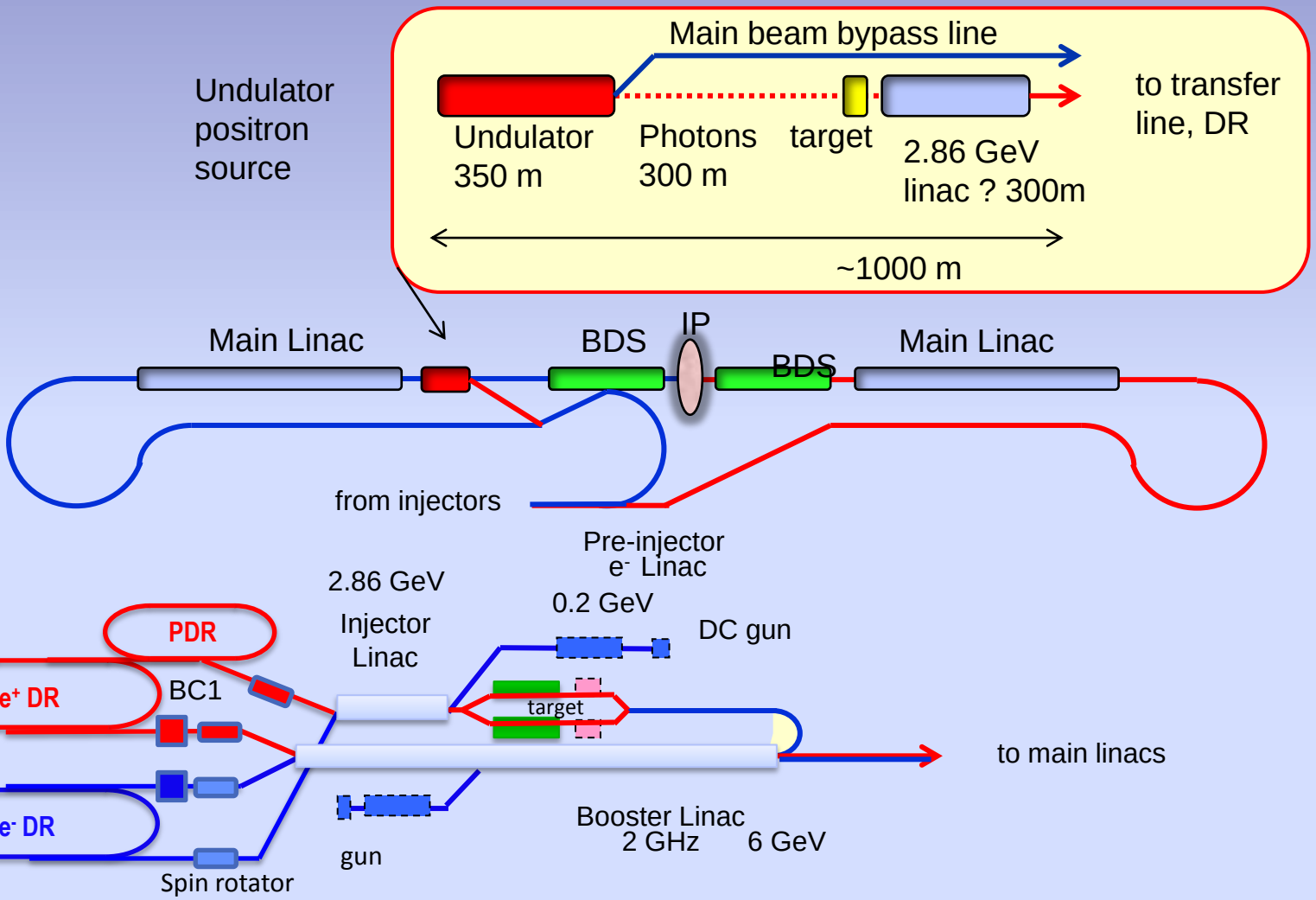
New CLIC base line studies

Alternative layout: without positron driver linac and e⁻ PDR, 2 GHz bunch spacing everywhere



Save two rings, positron driver linac, and tunnel length (saving potential 200 MCHF)

Layout with undulator based positron source



Minimum scenario for upgrade to positron polarization and fully compatible with conventional layout

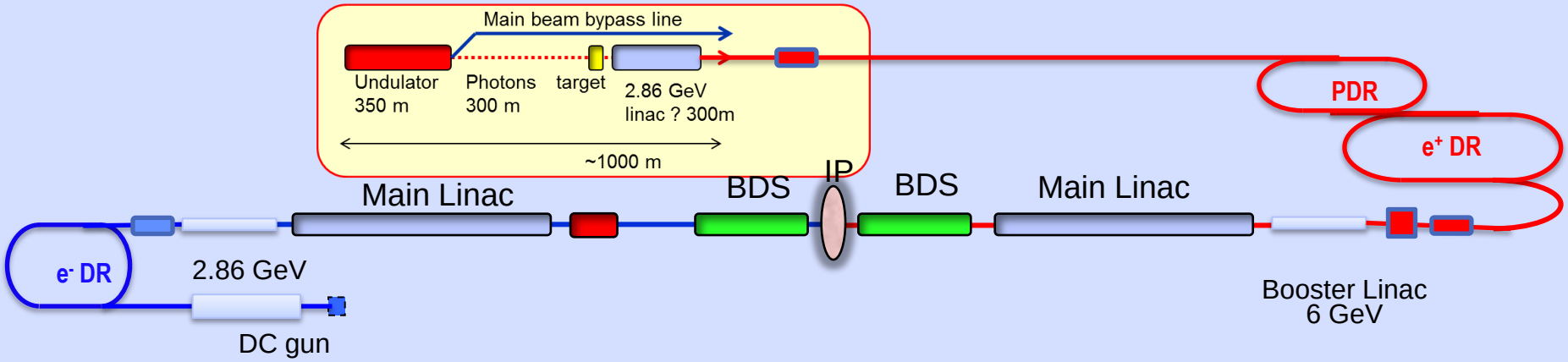
Undulator based positron source

Consequences:

- 400 -1000 m more linac length (both sides ?)
- Separate injector linac for positrons 2.86 GeV
- transfer line from the tunnel to the injector complex
- Spin rotator before and after damping ring (needed anyway for any polarized scheme)
- Gap in damping ring due the delayed beams
- Main beam bypass around positron production
- Coupling of the two beams

How about a dedicated scheme ?

DR and injector at the end of each side



Conclusion

- For time being minimum effort going into the main beam injector studies due to lack of manpower and other priorities in the project
  We feel it is not the most critical area for CLIC to work on
- Some effort in developing the drive beam injector front end including the sophisticated power sources. Wide band for sub-harmonic switching and very high efficiency for drive beam
- Hopefully we can revive some work on the positron source with the new student
- No conclusions yet for the new baseline