

# WG3a: Introductory remarks

- Review  $e^+/e^-$  sources requirements & concepts
- Discuss possible design concept(s) for the baseline
  - Electron source: DC + sub-harmonic bunching scheme
  - Positron source: conventional vs. undulator
- But also discuss possible alternative to baseline design, based on present on-going R&D
  - Electron sources (main advantage removal of complicated sub-harmonic bunching)
    - VHV DC gun
    - RF-gun
  - Positron source: Compton-based

# WG3a: Introductory remarks

- Two sessions on e<sup>-</sup> sources:
  - On-going R&D toward alternative injector (Tuesday pm)
    - DC (VHV), N-cooled rf-gun, PWT-based rf-gun
  - Discussion of the baseline design (Wednesday pm)
    - Start discussion with TESLA TDR polarized electron source
- Four sessions on e<sup>+</sup> sources:
  - Conventional source; targets, AMD (Tuesday am)
  - Undulator-based source (Wednesday am)
  - Compton-based source (Thursday am)
  - Discussion (Thursday pm)

# WG3a: Requirements on e-/e+ sources

Parameters	symbols	units	Nominal	Low N
Particle per bunch	$N$	$\times 10^{10}$	2	1
Number of bunch	$n_b$		2820	5640
Bunch spacing	$Dt_b$	ns	308	154
Macropulse duration	$t_{\text{pulse}}$	$\mu\text{s}$	870	870
Macropulse frequency	$f$	Hz	5	5
Polarization e-	$P_{e-}$	%	>80	>80
Polarization e+ (optional)	$P_{e+}$	%	~60	~60
Transverse emittance (normalized)	$e_{x,y}$	$\mu\text{m}, \text{nm}$	9.6,40	10,30
Bunch length	$S_z$	$\mu\text{m}$	300	150

# WG3a: Requirements on e-/e+ sources

- “Source” consists of
  - pre-injector: produce, manipulate (e.g. bunch) and accelerate beam to a sufficiently high energy to “freeze” the phase space
  - injector: accelerates up to DR injection energy (5 GeV)
- Requirements on beam parameters at (either e+ or e-) injector exit are given by e+ DR acceptance:
  - $A_{x,y} \sim 0.04$  mm-mrad
  - $\delta E/E \sim 1$  % FW