

EDR planning for the Compton

PosiPol Collaboration

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e+ source meeting@ANL

19/Sep/2007

In case of Positron

- ▶ There are many ambiguities in ILC e^+ source; Many R&D are required even for the baseline.
- ▶ Both baseline and alternative schemes have each important roll;
 - **Baseline scheme, Undulator, is likely to be possible, but need an amount R&D to give our full confidence.**
 - **Alternative scheme, Laser Compton, has more ambiguities, but it is attractive in many points, it has tight connections to other fields, and many improvements are expected.**

Compton is an attractive alternative

Independent system

high polarization

5 Hz polarization flip

Operability (especially low energy operation)

wide applications

Roll of Laser Compton in EDR Phase

- ▶ *To promote and improve collaboration between groups working on ILC related R&D: (Purpose of EDR phase by N. Walker in LCWS07)*
 - *To encourage a broader participation from active groups around the world*
 - *To attract new researchers to the field.*
- ▶ Laser-Compton has a large potential as a future technology. Many common efforts can be shared in a context of various applications.
- ▶ Then, Laser Compton technology can be a powerful driving force by attracting many researchers, who belongs not to ILC effort. It is one of the best item of EDR promotion.

Laser Compton EDR Milestones

- ▶ June 07: EDR Scope definition: design depth and breadth, cost, schedule, staff.
- ▶ June 08: Complete the conceptual design of the components and system.
- ▶ Dec 08: Complete basic R&D.
- ▶ March 09: Freeze layout, full component and civil specifications
- ▶ June 09: EDR detailed component inventory.
- ▶ September 09: Cost and technical review for the configuration change.
- ▶ Dec 09: Deliver EDR.
- ▶ Jan 10: System and Layout design for the mini-ILC e^+ source.
- ▶ Jan 11 : Start the construction of mini-ILC e^+ source based on Laser Compton.

Work Packages (Laser Compton)

			Work			
			Conceptual Design	R&D	Prototyping	Engineering Desing
Laser Compton	System Design		Many			
	Light Source	Laser Oscillator	KEK,BNL,LAL	KEK,BNL,LAL	KEK, LAL	KEK, LAL
		Laser Amplifier	KEK,BNL,LAL	KEK,BNL,LAL	KEK, LAL	KEK, LAL
	Optical Cavity	C02 laser	BNL	BNL	BNL	BNL
		2-mirrors cavity	KEK	KEK	KEK	KEK
		4-mirrors cavity	LAL	LAL	LAL	LAL
	ElectronSourc	Electron Injector	BNL, KEK	BNL, KEK		
		Storage Ring	Kharkov	Kharkov		
		ERL	ERL projects	ERL projects	ERL projects	
	Target	Rotating W-Re				
	Capture Optics	Design	LAL, IPNL	LAL, IPNL		
		Lithium lens	BINP, Cornell	BINP, Cornell	BINP, Cornell	BINP, Cornell
	Capture RF	NC L-band Acc	LAL, ANL	LAL		
	E+ stacking	e+ stacking	LAL, CERN	LAL, CERN	LAL, CERN	LAL, CERN
	System Integration	Laser + Cavity + e- beam	KEK,BNL,LAL, Hiroshima	KEK,BNL,LAL, Hiroshima	KEK,BNL,LAL, Hiroshima	KEK,BNL,LAL, Hiroshima
ILC e+ prototyping		KEK, BNL, LAL, IHEP, Hiroshima				

WP time line (Laser Compton)

Year	07			08				09				10				
Quarter	2 nd Q	3 rd Q	4 th Q	1 st Q	2 nd Q	3 rd Q	4 th Q	1 st Q	2 nd Q	3 rd Q	4 th Q	1 st Q	2 nd Q	3 rd Q	4 th Q	
Laser Compton	System Design	Conceptual Design			Basic R&D											
	Laser Oscillator	Conceptual Design		Basic R&D	Basic R&D		Engineering Design		Engineering Design							
	Laser Amplifier	Conceptual Design			Basic R&D				Engineering Design				Prototyping			
	CO2 laser cavity	Conceptual Design		Basic R&D	Basic R&D		Engineering Design		Engineering Design							
	Optical Cavity	Conceptual Design			Basic R&D				Engineering Design				Prototyping			
	2-mirrors cavity	Basic R&D			Engineering Design				Prototyping							
	4-mirrors cavity	Conceptual Design			Basic R&D				Engineering Design				Prototyping			
	System Integration	Basic R&D			Basic R&D				Engineering Design				Prototyping			
	Electron Injector	Conceptual Design			Basic R&D				Engineering Design							
	Storage Ring	Conceptual Design			Basic R&D				Engineering Design							
	ERL	Conceptual Design			Basic R&D				Engineering Design				Prototyping			
	Solid target	Conceptual Design														
	NC L-band Acc	Conceptual Design			Basic R&D				Engineering Design							
	SI Laser + Optical Cavity + e- beam	Basic R&D			Basic R&D				Engineering Design				Prototyping			
	ILC e+ Prototyping	Conceptual Design			Conceptual Design				Conceptual Design				Prototyping			

Legend

Conceptual Design
Basic R&D
Engineering Design
Prototyping

Laser Compton Time Line Summary

Year	07			08				09				10			
Quarter	2 nd Q	3 rd Q	4th Q	1 st Q	2 nd Q	3 rd Q	4th Q	1 st Q	2 nd Q	3 rd Q	4th Q	1 st Q	2 nd Q	3 rd Q	4th Q
Conceptual Design	■														
R&D	■														
ED and EDR writing								■							
Mini-ILC e+												■			

Cost Estimate (Laser Compton)

No cost estimation is available yet.

We are now making inventories of necessary components.

The first version of the inventories will be shown in the kick-off-meeting at Daresbury.

Summary

- ▶ Laser Compton is an attractive alternative, although it has still large ambiguity.
- ▶ Laser Compton is very important as driving forces by attracting wide variety of people.
- ▶ R&D efforts can and should be shared with various efforts to save our limited resources, but be careful about deliver time and missing pieces.
- ▶ A set of WPs and its time-line are presented.