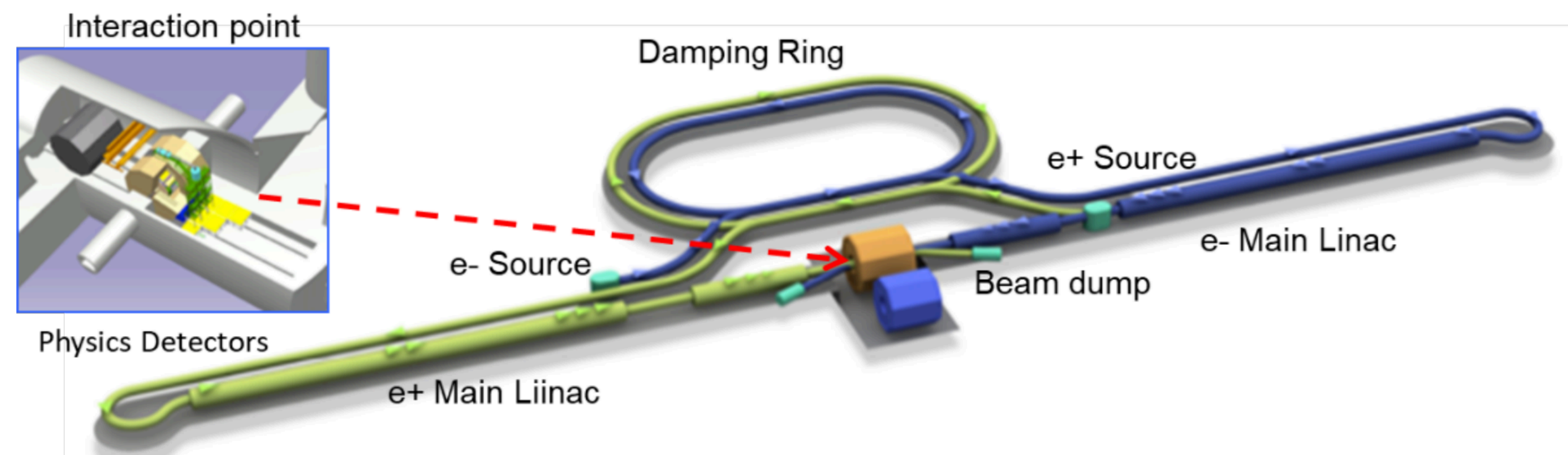


Invitation to the BCLC Workshop 21-22/7/2021

Carsten Hensel for the Organizing Committee



RENAFAE Workshop 12/07/2021

What's BCLC?

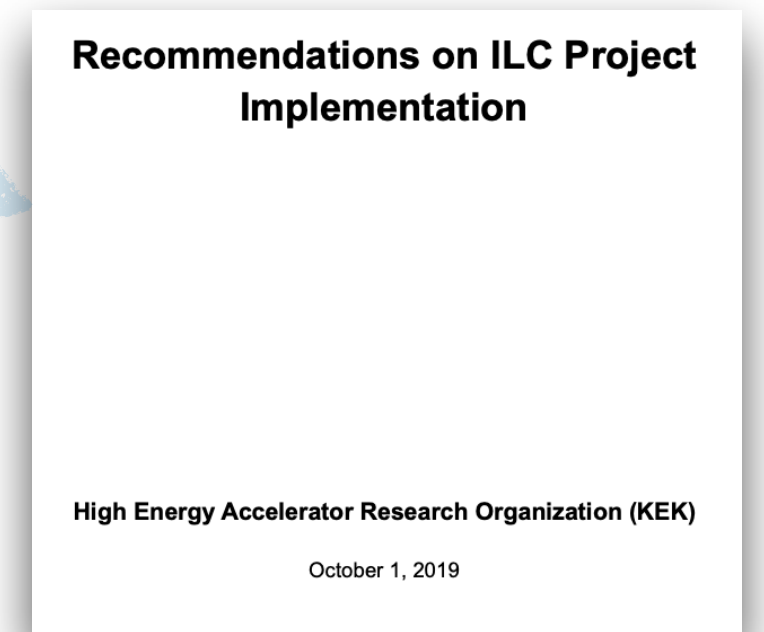
Brazilian Center for Linear Collider Studies



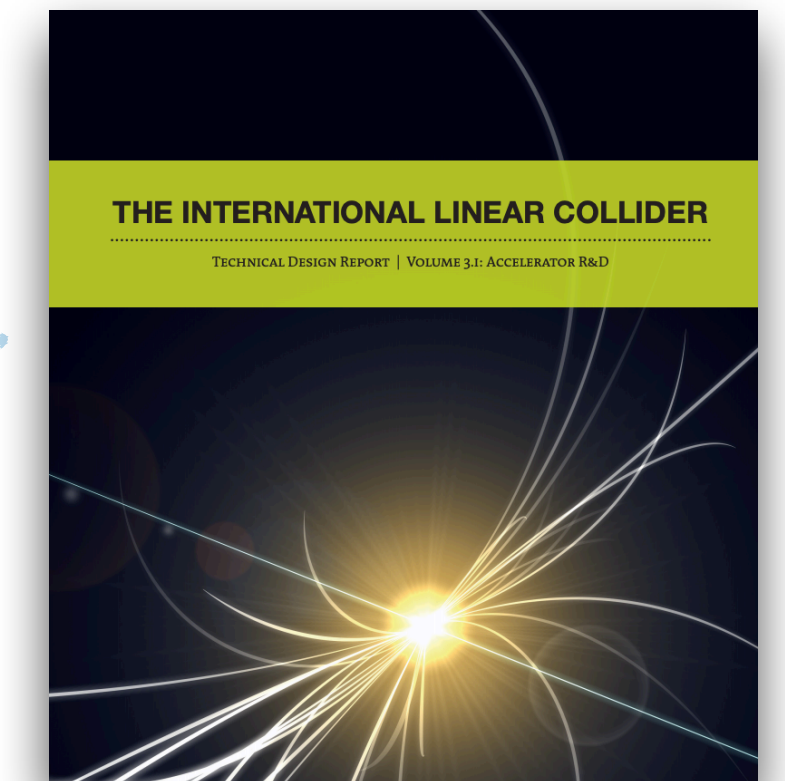
Isn't the Linear Collider
something far in the future?

ILC Status

as of 2019 KEK report

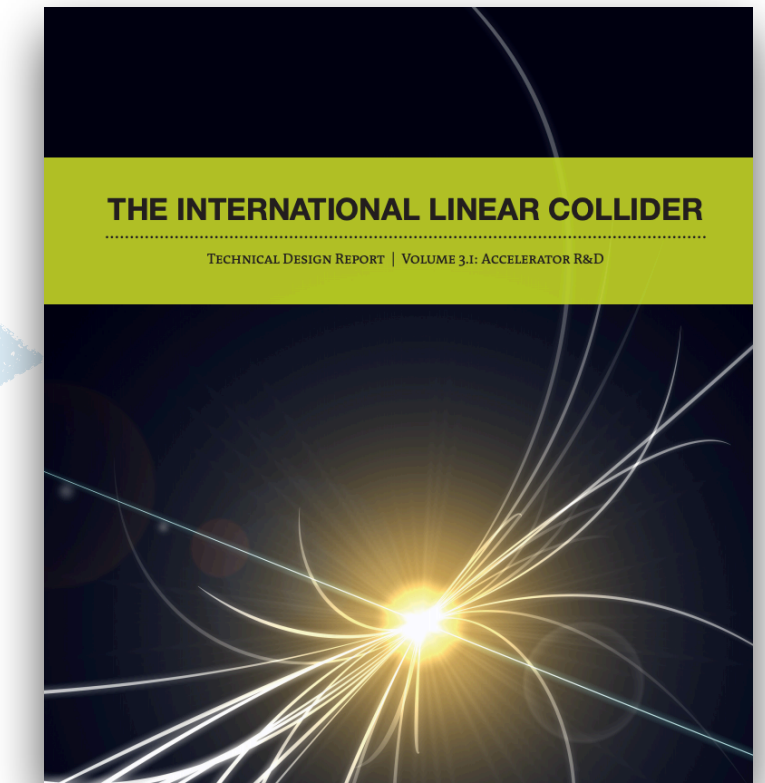


- ILC is a next-generation experimental facility to explore fundamental laws of the universe.
- importance of e^+e^- collider has been long recognized
- global design team, **GDE**, was set up under **ICFA** for design and coordination of R&D in 2005
- KEK proposed in 2012 that Japan should host ILC which was welcomed by HEP community
- ILC Technical Design Report was completed in 2013
- ICFA then established **Linear Collider Collaboration, LCC**, and the **Linear Collider Board, LCB**.
 - LCC combines ILC and CLIC
- 2020: ICFA reconfirms the international consensus for a Higgs factory and wishes to see the timely construction of the ILC in Japan.

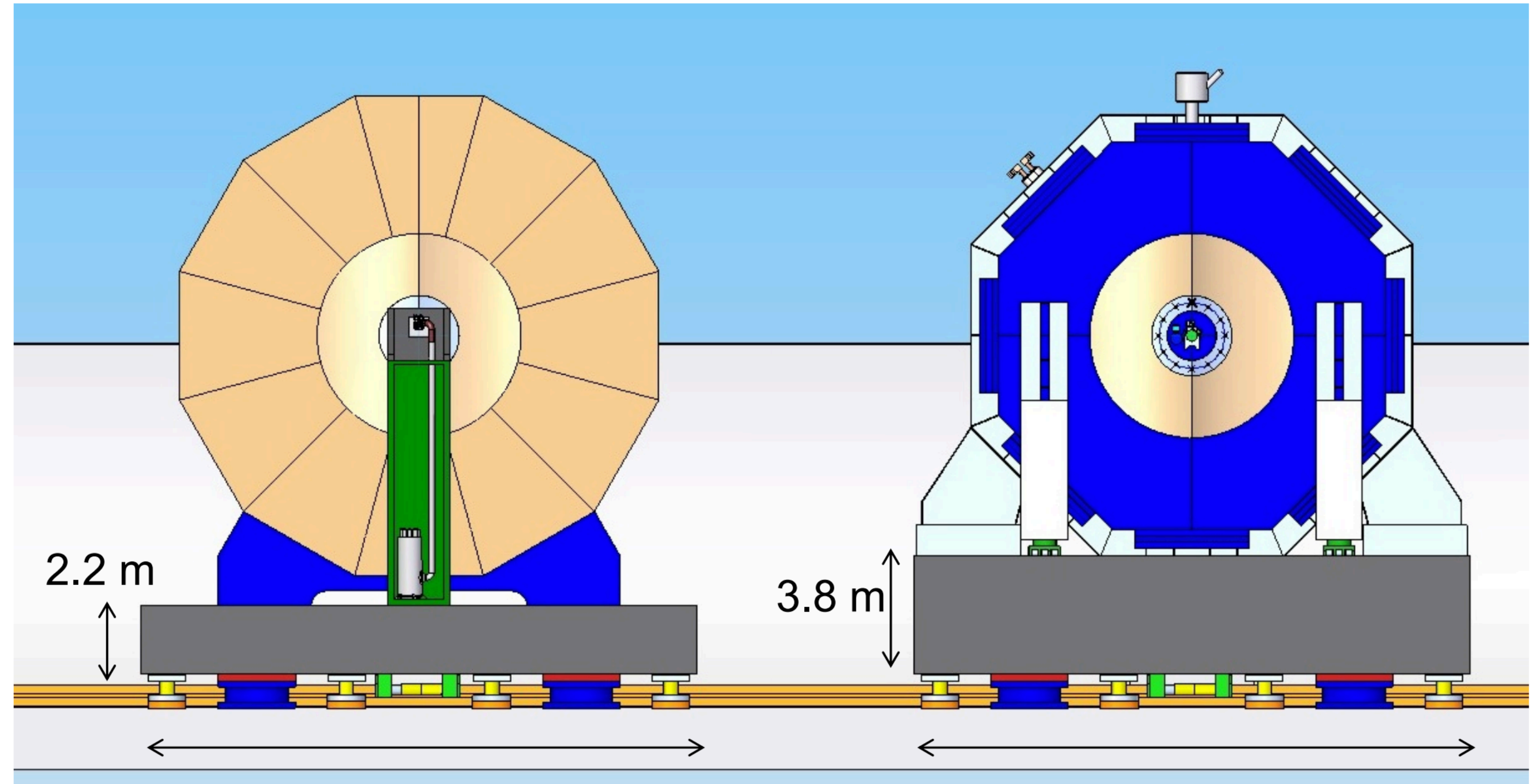


What is the plan for the ILC?

Technical Aspects according to 2013 TDR



- 2x11 km linear accelerators
- $\sqrt{s} \sim 250\text{-}500$ GeV
- long. polarized beams (30/80)
- instead of two IP, two detectors in push-pull configuration
 - SiD: compact detector
 - SLD: larger detector
- check out TDR for more details



How can I contribute?

Joining Studies For Next-gen e^+e^- Collider

ILC allows for various levels of contributions

- study physics analyses of e^+e^- reactions
 - probably the easiest way to contribute
 - **requires membership** to have access to existing MC
- study reconstruction of particle signals in e^+e^- environment (detector design)
 - requires a much closer connection to existing groups
- study of state of the art detector components & new technologies for high precision measurements
 - This one might be pricey (depending on the situation at your home institute).

Examples For Open Topics

see ILC Study: Questions for Snowmass 2021

- Are LO parton-level generators sufficient for high-precision jet measurements?
- How can $e^+e^- \rightarrow Zh$ be separated from $e^+e^- \rightarrow ZZ$?
- What precision can be reached when measuring the $t\bar{t}$ threshold?
- Which options are left for new $e^+e^- \rightarrow ff$ s-channel resonances?
- Can we improve the W mass measurement precision at 250 GeV?
- Study the **Giga-Z** (200 x LEP) case.
- ...

- Quite a few topics available.
- Coordinate with the corresponding groups!



Why BCLC?

What's next?

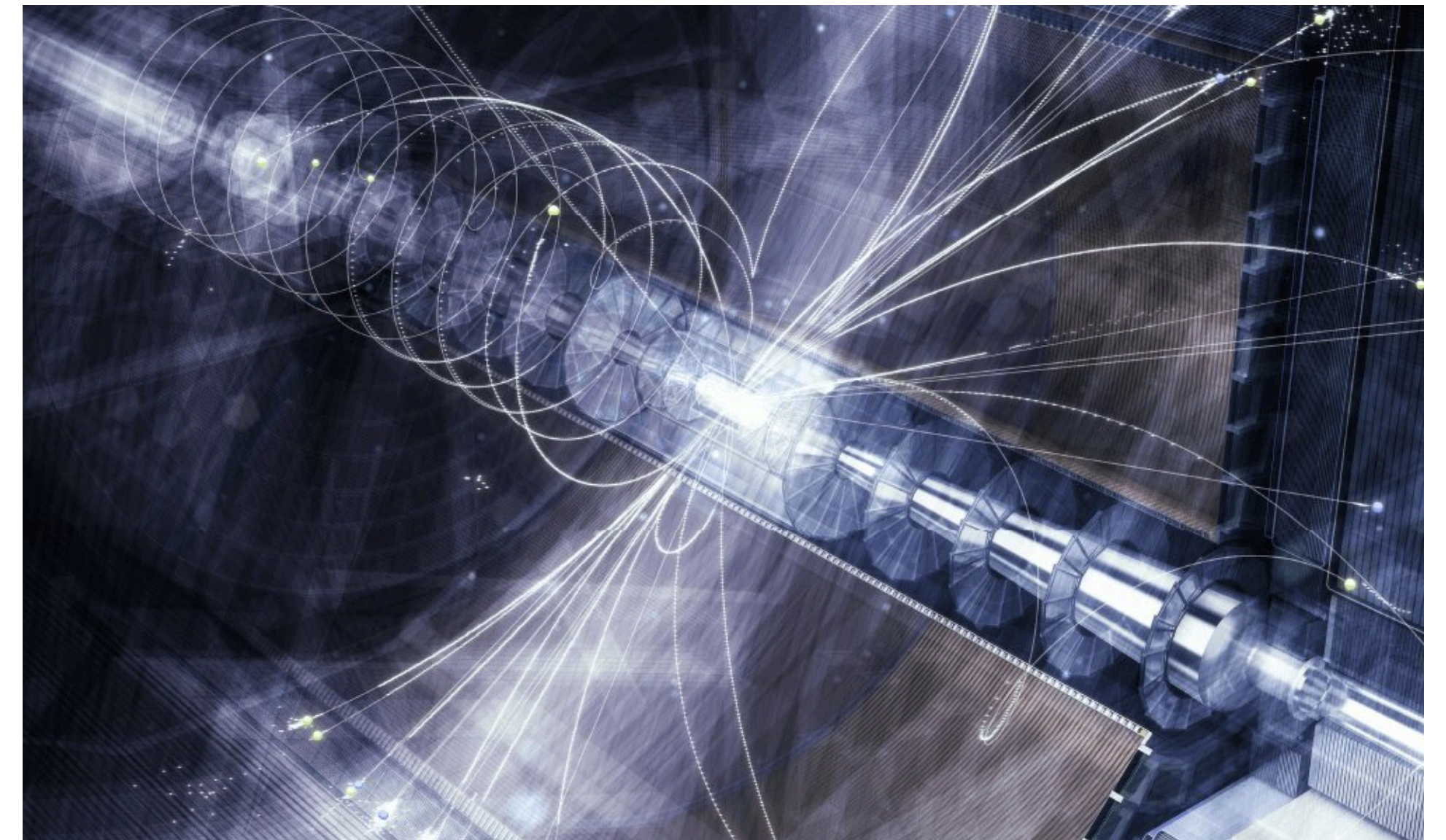
This is for everyone already contributing or thinking about contributing!

- The ILC efforts make it easy to contribute as a single person.
- But maybe we should consider to contribute as a group?
 - **Brazilian LC group**
 - (South American LC group)
- Sharing and organizing resources might be the most efficient way to contribute recognizably and **make an impact**.
 - This is especially true for everyone working on other projects as well.

Proposal: BCLC

Brazilian Center for Linear Collider Studies

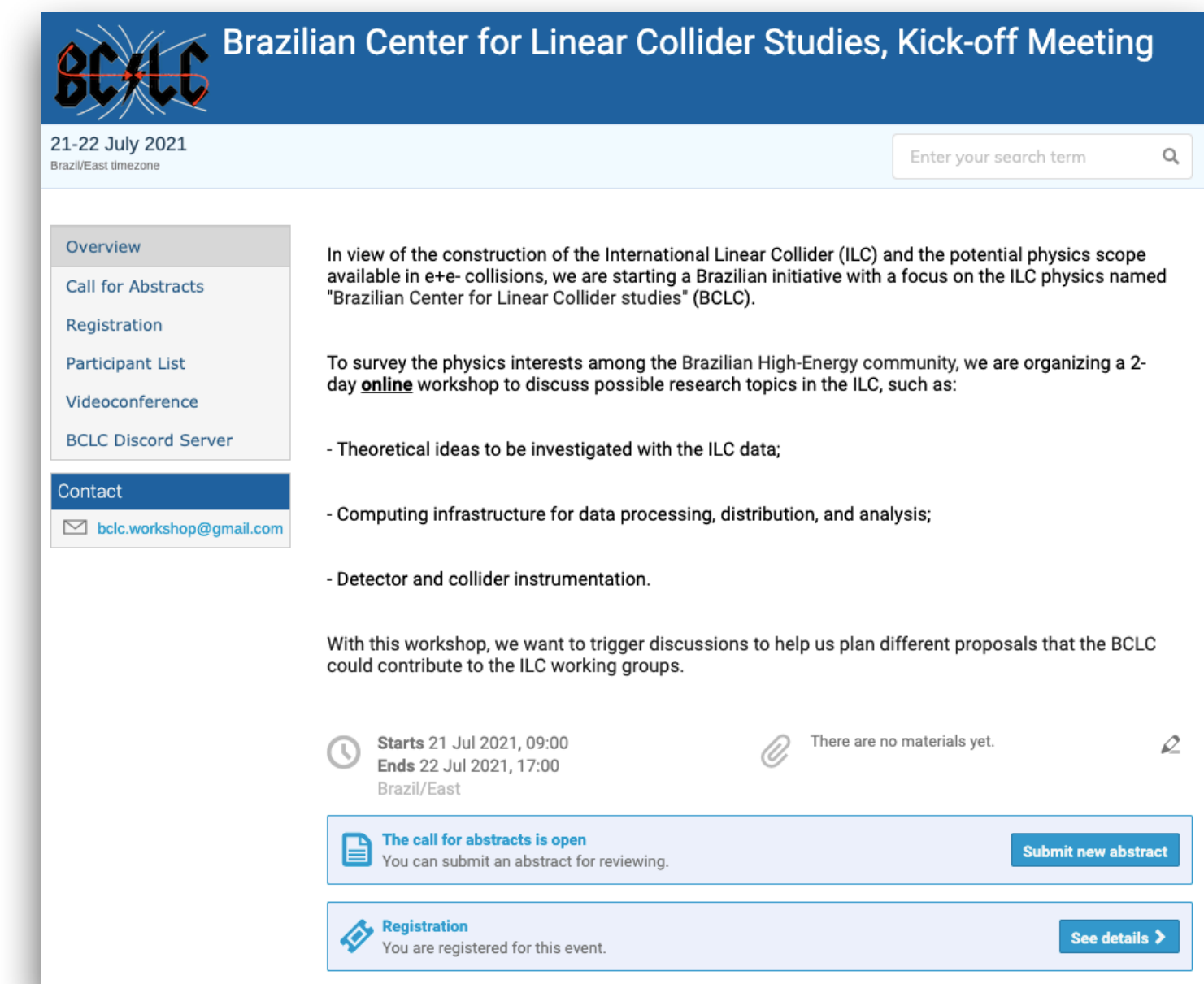
- virtual community to **foster, support and coordinate LC studies** in Brazil
 - not attached to any institute
 - bring theory and experiment together
 - (seed efforts for a similar group within South America)
- **represent LC efforts in Brazil** and speak with one voice
- keep track of expertise
- share resources and **reduce overhead**
- organize events
 - seminars (invited speakers from abroad)
 - lectures
 - **workshops**



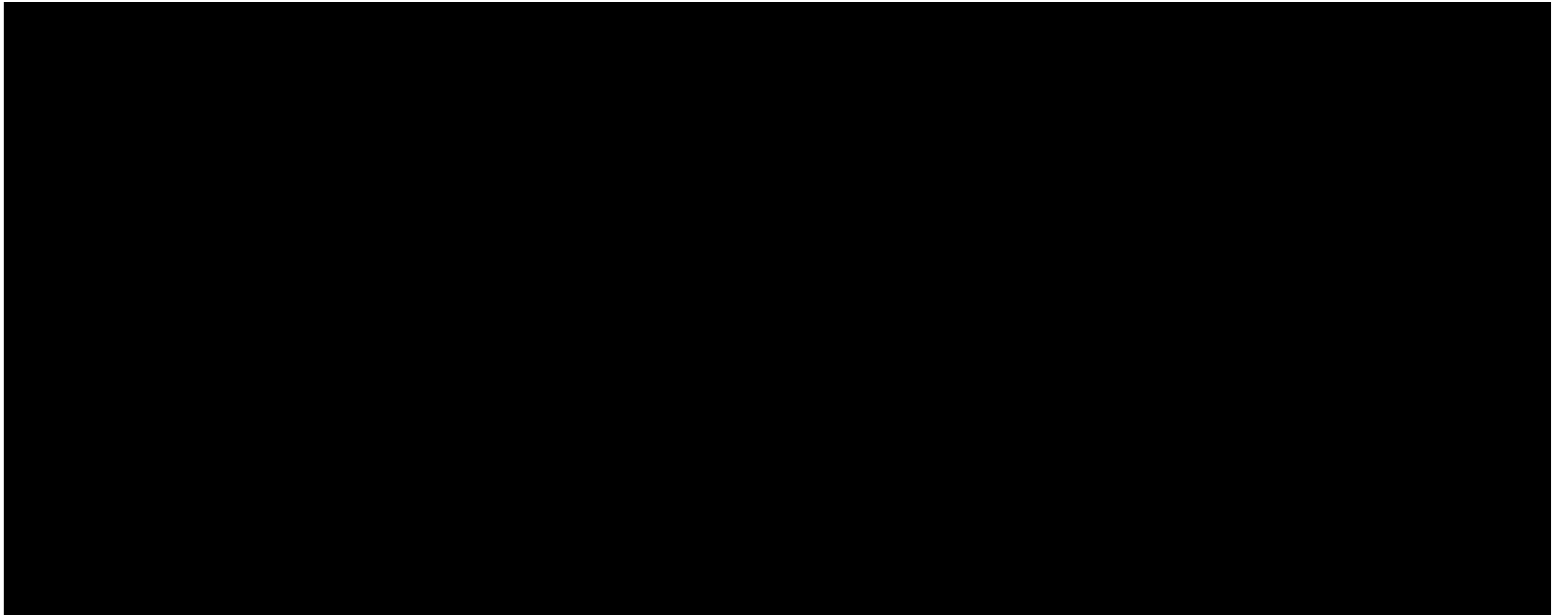
BCLC Workshop 21-22/7/2021

BCLC Kick-off Event

- 2 day online workshop with the goal to **establish BCLC**
- **day 1** Lowering the threshold - How to get involved?
 - ILCSoft tutorial
 - discussion on technical aspects
- **day 2** ILC Status and Plans
 - ILC WG3 **Physics & Detector Spokespersons** will be opening session
 - presentations from South American contributors



The screenshot shows the website for the Brazilian Center for Linear Collider Studies (BCLC) Kick-off Meeting. The header includes the BCLC logo and the text "Brazilian Center for Linear Collider Studies, Kick-off Meeting". Below the header, the dates "21-22 July 2021" and "Brazil/East timezone" are displayed. A search bar is present in the top right corner. The main content area is divided into a left sidebar with navigation links (Overview, Call for Abstracts, Registration, Participant List, Videoconference, BCLC Discord Server, Contact) and a main text area. The main text area contains an overview of the workshop, a list of topics to be discussed (Theoretical ideas, Computing infrastructure, Detector and collider instrumentation), and a call for abstracts section. The call for abstracts section indicates that the call is open and provides a "Submit new abstract" button. The registration section indicates that the user is registered for the event and provides a "See details" button.



Hope to see you/talk to you next week!

Additional Information

Joining SiD and ILD

What does it cost?

- Money is always and everywhere an issue. Especially true when colleagues have to fear that ILC contributions might siphon off resources.
- Both SiD and ILD offer **lightweight guest membership**.
- guest membership is **free**!
- requires to adhere to publication rules

Topic	Parameter	Accuracy $\Delta X/X$		
Higgs	m_h	0.03%	$\Delta m_h = 35 \text{ MeV, 250 GeV}$ 250 GeV and 500 GeV	
	Γ_h	1.6%		
	$g(hWW)$	0.24%		
	$g(hZZ)$	0.30%		
	$g(hb\bar{b})$	0.94%		
	$g(hc\bar{c})$	2.5%		
	$g(hgg)$	2.0%		
	$g(h\tau^+\tau^-)$	1.9%		
	$BR(h \rightarrow \text{invis.})$	< 0.30% (95% conf.)		
	$g(ht\bar{t})$	3.7%	1000 GeV	
	$g(hhh)$	26%		
$g(h\mu^+\mu^-)$	16%			
Top	m_t	0.02%	$\Delta m_t = 34 \text{ MeV, threshold scan}$	
	Γ_t	2.4%		
	\tilde{F}_{1Y}^γ	0.2%	500 GeV	
	\tilde{F}_{1Z}^γ	0.3%		
	\tilde{F}_{1A}^γ	0.5%		
	\tilde{F}_{2Y}^γ	0.3%		
	\tilde{F}_{2V}^γ	0.6%		
	W	m_W	0.004%	$\Delta m_W = 3 \text{ MeV, threshold scan}$
		g_1	0.16%	500 GeV
κ_γ		0.03%		
κ_Z		0.03%		
λ_γ		0.06%		
λ_Z		0.07%		
H^0, A^0	m_H, m_A	1.5%		
	$\tan \beta$	20%		
$\tilde{\chi}^+$	$m(\tilde{\chi}^+)$	1%		
	$m(\tilde{\chi}^0)$	1%		
\tilde{t}	$m(\tilde{t})$	1%		
	$\cos \theta_t$	0.4%		

Abbreviations

- **ILC** International Linear Collider
- **LCC** Linear Collider Collaboration
- **SID** Silicon Detector (Detector for ILC)
- **ILD** International Large Detector
- **ECFA/ACFA/ICFA** European/Asian/International Committee for Future Accelerators
- **CLIC** Compact Linear Collider