

W/Z physics in CDR

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中國科學院為能物理研究所 Institute of High Energy Thysics

News: CEPC Workshop

- CEPC workshop
 - 24-26 May 2018
 - Università degli Studi Roma
 - https://agenda.infn.it/conferenceDisplay.py?confld=14816

Workshop on the Circular **Electron-Positron Collider**

EU Edition

Roma, May 24-26 2018 University of Roma Tre



enda.infn.it/conferenceDisplay.py?ovw=True&confid=148

Local Organizing Committee Antonio Baroncelli - INFN, Italy Biagio Di Micco - Roma Tre Univ. & INFN, Italy Ada Farilla - INFN, Italy Francesca Paolucci - Roma Tre Univ. & INFN, Italy Domizia Orestano - Roma Tre Univ. & INFN, Italy Marco Sessa - Roma Tre Univ. & INFN, Italy Monica Verducci - Roma Tre Univ. & INFN, Italy





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Scientific Committee

Related talks in CEPC workshop



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	Physics	14:30	17:00	2:3	30 F. Piccin	F. Piccinini, R. Manqi		
	Z pole+WW	14:30	15:15	0:4	45		P. Azzurri	
	Z+Higgs	15:15	16:00	0:4	45		Yaquan Fang	
	top	16:00	16:30	0:3	30		M. Vos	
	BSM	16:30	17:00	0:3	30		B. Mele	
Physics/Sim.		14:30	16:30	2:00	Patrizia Azz	atrizia Azzi, Yaquan Fang, Gang Li, Jenny List		
H->invisible		14:30	15:00	0:30		Xin Shi (Confirmed
Precision Higgs Conbination		15:00	15:30	0:30		Kaili Zhang		Confirmed
Machine learning for ee		15:30	16:00	0:30		Sofia Vallecorsa		Confirmed
Physics at the Z pole		16:00	16:30	0:30		Zhijun Liang		Confirmed
Buer		10.20	10.10	0.20		ч _Б		
Physics/Sim.		17:00	18:30	1:30	Patrizia Azz	trizia Azzi, Yaquan Fang, Gang Li, Jenny List		nny List
ee->ZH ISR correction		17:00	17:30	0:30		Mario Grec	:0	Confirmed
W mass measurement		17:30	18:00	0:30		Hengne Li		Confirmed
2HDM at ee		18:00	18:30	0:30		Bruce Mella	ado	Confirmed
	Physics/Sim. H->invisible Precision Higgs C Machine learning Physics at the Z p Physics/Sim. ee->ZH ISR corre W mass measure	Z pole+WW Z+Higgs top BSM Physics/Sim. H->invisible Precision Higgs Conbination Machine learning for ee Physics at the Z pole Physics at the Z pole Physics/Sim. ee->ZH ISR correction W mass measurement	Z pole+WW14:30Z+Higgs15:15top16:00BSM16:30Physics/Sim.14:30H->invisible14:30Precision Higgs Conbination15:00Machine learning for ee15:30Physics at the Z pole16:00Physics/Sim.17:00ee->ZH ISR correction17:00W mass measurement17:30	Z pole+WW 14:30 15:15 Z+Higgs 15:15 16:00 top 16:00 16:30 BSM 16:30 17:00 Physics/Sim. 14:30 16:30 H->invisible 14:30 15:00 Precision Higgs Conbination 15:00 15:30 Machine learning for ee 15:30 16:00 Physics/Sim. 16:00 16:30 Physics/Sim. 10:00 16:30 Physics/Sim. 10:00 16:30 Physics/Sim. 17:00 18:30 ee->ZH ISR correction 17:30 18:00 W mass measurement 17:30 18:00	Z pole+WW 14:30 15:15 0:4 Z+Higgs 15:15 16:00 0:4 top 16:00 16:30 0:3 BSM 16:30 17:00 0:3 Physics/Sim. 14:30 16:30 2:00 H->invisible 14:30 16:30 0:30 Precision Higgs Conbination 15:00 15:30 0:30 Machine learning for ee 15:30 16:00 0:30 Physics/Sim. 10:00 16:30 0:30 Physics at the Z pole 16:00 16:30 0:30 Physics/Sim. 17:00 17:30 130 ee->ZH ISR correction 17:00 17:30 0:30 W mass measurement 17:30 18:00 0:30	Z pole+WW 14:30 15:15 0:45 Z+Higgs 15:15 16:00 0:45 top 16:00 16:30 0:30 BSM 16:30 17:00 0:30 Physics/Sim. 14:30 16:30 2:00 Patrizia Azz H->invisible 14:30 15:00 0:30 16:00 Precision Higgs Conbination 15:00 15:30 0:30 16:00 Machine learning for ee 15:30 16:00 0:30 16:00 Physics/Sim. 16:00 16:30 0:30 16:00 Physics at the Z pole 16:00 16:30 0:30 16:00 Physics/Sim. 17:00 18:30 1:30 Patrizia Azz Physics/Sim. 17:00 18:30 0:30 1:00 W mass measurement 17:30 18:00 0:30 1:00	Z pole+WW 14:30 15:15 0:45 Z+Higgs 15:15 16:00 0:45 top 16:00 16:30 0:30 BSM 16:30 17:00 0:30 Physics/Sim. 14:30 16:30 2:00 Patrizia Azzi, Yaquan Fa H->invisible 14:30 15:00 0:30 Xin Shi Precision Higgs Conbination 15:00 15:30 0:30 Kaili Zhang Machine learning for ee 15:30 16:00 0:30 Zhijun Lian Physics/Sim. 17:00 18:30 1:30 Patrizia Azzi, Yaquan Fa Physics/Sim. 17:00 18:30 0:30 Zhijun Lian Physics/Sim. 17:00 18:30 1:30 Patrizia Azzi, Yaquan Fa ee->ZH ISR correction 17:00 18:30 0:30 Mario Gree W mass measurement 17:30 18:00 0:30 Hengne Li	Physics 14:30 17:00 2:30 F. Piccinin, R. Manqi Z pole+WW 14:30 15:15 $0:45$ P. Azzurri Z+Higgs 15:15 $16:00$ $0:45$ Yaquan Fang top 16:00 $16:30$ $0:30$ M. Vos BSM 16:30 $17:00$ $0:30$ M. Vos Physics/Sim. 14:30 $16:30$ $2:00$ Patrizia Azzi, Yaquan Fang, Gang Li, Jen H->invisible 14:30 $15:00$ $0:30$ Xin Shi Precision Higgs Conbination 15:00 $0:30$ Kaili Zhang Machine learning for ee 15:30 $16:30$ $0:30$ Kaili Zhang Physics/Sim. 17:00 $18:30$ $1:30$ Zhijun Liang Physics/Sim. 17:00 $18:30$ $1:30$ Patrizia Azzi, Yaquan Fang, Gang Li, Jen Physics/Sim. 17:00 $18:30$ $1:30$ Patrizia Azzi, Yaquan Fang, Gang Li, Jen ee->ZH ISR correction $17:00$ $18:30$ $0:30$ Mario Grec W mass measurem

Welcome Dr. Hengne Li joining CEPC electroweak study

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Reminder of CEPC W/Z runs



- Some discussion about CEPC Z pole running .
 - http://indico.ihep.ac.cn/event/7709/
 - E=240GeV, L=1.6 X 10³⁵ cm⁻²s⁻¹, solenoid field = 3T (new default)
 - Two year running proposed by accelerator team
- WW threshold scan
 - Proposal from accelerator team
 - One year running about 160GeV
 - Total luminosity 3.2 ab⁻¹

CEPC W/Z physics Plan for CDR



- Plan to cover the prospects of 6-7 key parameters.
- Plan to have First draft of CDR about W/Z physics ready by end of May.

– http://cepcgit.ihep.ac.cn/cepcdoc/CDR

Observable	LEP precision	CEPC precision	CEPC runs	$\int \mathcal{L}$ needed in CEPC
m_Z	$2 { m MeV}$	$0.5 \mathrm{MeV}$	Z threshold scan runs	$1ab^{-1}$
m_W	$33 { m MeV}$	$2-3 { m MeV}$	WWthreshold, ZH runs	$5 { m ab}^{-1}$
A^b_{FB}	1.7%	0.1%	${\cal Z}$ threshold scan runs	$1 \mathrm{ab}^{-1}$
$\sin^2 ilde{ heta}_W^{ ext{eff}}$	0.07%	0.01%	${\cal Z}$ threshold scan runs	$1 \mathrm{ab}^{-1}$
R_b	0.3%	0.05%	Z pole	$1 \mathrm{ab}^{-1}$
$N_{ u}$	1.7%	0.05%	ZH runs	$5 \mathrm{ab}^{-1}$
R_{μ}	0.2%	0.01%	Z pole	$1 \mathrm{fb}^{-1}$

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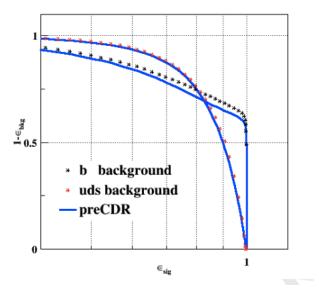




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Performance input

- Identify some performance input needed to support the W/Z physics prospect study
 - May need to repeat some study with 3T magnetic field and new detector geometry
- Afb(I): lepton angular resolution
- R_b: "B jet efficiency" vs "cjet/light rejection "
- W mass (direct approach) : jet energy resolution
- W mass (threshold scan): ?
- N_v : photon energy resolution



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