

## W/Z physics in CDR

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### 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

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## 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 <sub>Б</sub>		
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 10<sup>35</sup> cm<sup>-2</sup>s<sup>-1</sup>, 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<sup>-1</sup>

# 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	$5 \mathrm{ab}^{-1}$
$R_{\mu}$	0.2%	0.01%	Z pole	$1 \mathrm{fb}^{-1}$

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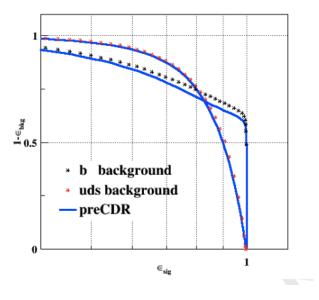




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### Performance input

- 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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