

School on Precision Higgs Factory Physics

Report of Contributions

Contribution ID: 1

Type: **not specified**

Verifying the Resonance Schemes of Unstable Particles at Lepton Colliders

We propose practical ways of differentiating the various (Breit-Wigner, theoretical, and energy-dependent) resonance schemes of unstable particles at lepton colliders. First, the energy-dependent scheme can be distinguished from the other two by fitting the Z lineshape scan and forward-backward asymmetries at LEP and future lepton colliders with the Z mass m_Z , decay width Γ_Z , and coupling strength as fitting parameters. Although the Breit-Wigner and theoretical schemes work equally well, the scheme conversion requires the decay width Γ_Z to scale inversely with m_Z rather than the usual linear dependence from theoretical calculation. These contradicting behaviors can be used to distinguish the Breit-Wigner and theoretical schemes by the precision Z measurements with single parameter (m_Z) fit at future lepton colliders. For the WW threshold scan, its combination with the precise Fermi constant provides another way of distinguishing the Breit-Wigner and theoretical schemes.

Primary author: Prof. GE, Shao-Feng (TDLI-SJTU)

Presenter: Prof. GE, Shao-Feng (TDLI-SJTU)

Contribution ID: 2

Type: **not specified**

Introduction to the Standard Model of the Electroweak interaction

Monday, 13 October 2025 08:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 3

Type: **not specified**

Introduction to the renormalization of the Standard Model

Monday, 13 October 2025 09:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 4

Type: **not specified**

reduction to Master Integrals

Contribution ID: 5

Type: **not specified**

Introduction to the renormalization of the Standard Model

Monday, 13 October 2025 11:00 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 6

Type: **not specified**

ee->bb NLO QCD massive

Presenter: VICINI, Alessandro (University of Milano)

Contribution ID: 7

Type: **not specified**

ampl as combination of MI

Presenter: VICINI, Alessandro (University of Milano)

Contribution ID: 8

Type: **not specified**

BSM Higgs 1

Monday, 13 October 2025 13:30 (1h 30m)

Presenter: HEINEMEYER, Sven (IFT/IFCA (CSIC))

Contribution ID: 9

Type: **not specified**

Dark Matter 1

Monday, 13 October 2025 15:30 (1h 30m)

Presenter: MARTINEZ, Maria (CAPA/Zaragoza University)

Contribution ID: **10**

Type: **not specified**

Definition of inclusive cross section: perturbative expansion

Tuesday, 14 October 2025 08:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: **11**

Type: **not specified**

UV and IR divergences

Tuesday, 14 October 2025 09:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 12

Type: **not specified**

Hands-on session: Introduction to the automatic amplitude generation

Tuesday, 14 October 2025 11:00 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 13

Type: **not specified**

numerical check of the IR poles

Presenter: VICINI, Alessandro (University of Milano)

Contribution ID: **14**

Type: **not specified**

explicit run of KIRA

Presenter: VICINI, Alessandro (University of Milano)

Contribution ID: **15**

Type: **not specified**

BSM Higgs 2

Tuesday, 14 October 2025 13:30 (1h 30m)

Presenter: HEINEMEYER, Sven (IFT/IFCA (CSIC))

Contribution ID: **16**

Type: **not specified**

Machine Learning 1

Tuesday, 14 October 2025 15:30 (1h 30m)

Presenter: QU, Huilin (CERN)

Contribution ID: 17

Type: **not specified**

Reduction to Master Integrals of a squared matrix element

Wednesday, 15 October 2025 08:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: **18**

Type: **not specified**

Differential equations and Master Integrals

Wednesday, 15 October 2025 09:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 19

Type: **not specified**

and MIs

Contribution ID: **20**

Type: **not specified**

BSM Higgs 3

Wednesday, 15 October 2025 11:00 (1 hour)

Presenter: HEINEMEYER, Sven (IFT/IFCA (CSIC))

Contribution ID: 21

Type: **not specified**

Hands-on session: Master Integrals evaluation

Wednesday, 15 October 2025 13:30 (1h 30m)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 22

Type: **not specified**

Dark Matter 2

Wednesday, 15 October 2025 15:30 (1h 30m)

Presenter: MENG, Yue (Shanghai Jiao Tong University)

Contribution ID: 23

Type: **not specified**

Theoretical comments on UV renormalization

Thursday, 16 October 2025 08:30 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 24

Type: **not specified**

Machine Learning 2

Thursday, 16 October 2025 09:30 (1 hour)

Presenter: QU, Huilin (CERN)

Contribution ID: 25

Type: **not specified**

Hands-on test of UV finiteness

Thursday, 16 October 2025 11:00 (1 hour)

Presenter: VICINI, Alessandro (University of Milan)

Contribution ID: 26

Type: **not specified**

UV cancellation

Presenter: VICINI, Alessandro (University of Milano)

Contribution ID: 27

Type: **not specified**

Dark Matter 3

Thursday, 16 October 2025 13:30 (1h 30m)

Presenter: ZHOU, Ning (Shanghai Jiao Tong University)

Contribution ID: **28**

Type: **not specified**

Coffee break

Contribution ID: 29

Type: **not specified**

Machine Learning 3

Thursday, 16 October 2025 15:30 (1h 30m)

Presenter: QU, Huilin (CERN)

Contribution ID: **30**

Type: **not specified**

Dark Matter Practicum

Tuesday, 14 October 2025 18:30 (1 hour)

Presenter: MARTINEZ, Maria (CAPA/Zaragoza University)