Report of the Snowmass Working Group 03 of the Accelerator Frontier on Higgs Factories

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1: on C3, 2: on CepC and SppS, 3: on CLIC, 4: on ERL-FCCee, 5: on FCC-ee, 6: on FCC-pp, 7: on HE-LHC, 8: on ILC, 9: on LHeC, 10: on Muon collider.

Abstract

We address the goals, the designs, the technical state of readiness, and the approximate comparative costs the accelerators that are currently under discussion as Higgs factories. We also address their staging options for future energy-frontier colliders. The accelerators covered include many different techniques, including ring-ring colliders, linear colliers, and ERL-based linac-ring colliders.
*describe evolution. We will include an analysis of common needs and a comparative summary of readiness and possible timelines.*

Executive summary (by conveners, AF03 and AF)

Which accelerators are covered?

What are common technology needs?

What are timelines for each?

Accelerators with Higgs-factory potential

C3 normal conducting linear collider

Design outline

Readiness

Similar existing technology

State of Technical Design Report

State of Proposal

Proposals for upgrades or extensions

Evolution toward future experiments

CepC ring-ring collider and stageability to SppS

Design outline

Readiness

Similar existing technology

State of Technical Design Report

State of Proposal

Proposals for upgrades or extensions

Stageability to future experiments

CLIC linear collider

Design outline

Readiness

Similar existing technology

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State of Proposal

Proposals for upgrades or extensions

Stageability to future experiments

ERL-FCCee collider.

Design outline

Readiness

Similar existing technology

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State of Proposal

Proposals for upgrades or extensions

Stageability to future experiments

FCC-ee and stageability to FCC-pp

Design outline

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Stageability to future experiments

HE-LHC

Design outline

Readiness

Similar existing technology

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State of Proposal

Proposals for upgrades or extensions

Stageability to future experiments

ILC superconducting linear collider

Design outline

Readiness

Similar existing technology

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State of Proposal

Proposals for upgrades or extensions

Stageability to future experiments

LHeC ERL-ring collider

Design outline

Readiness

Similar existing technology

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State of Proposal

Proposals for upgrades or extensions

Stageability to future experiments

Common technology needs

Comparisons

Comparative Timelines

Comparative costing

Comparison of staging to future experiments

References