

Physics Performance and Detector Requirements at an Asymmetric Higgs Factory

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The Hybrid Asymmetric Linear Higgs Factory (HALHF) proposes a shorter and cheaper design for a future Higgs factory. It reaches a $\sqrt{s} = 250$ GeV using a 500 GeV electron beam accelerated by an electron-driven plasma wake-field, and a conventionally-accelerated 31 GeV positron beam. Assuming plasma acceleration R&D challenges are solved in a timely manner, the asymmetry of the collisions brings additional challenges regarding the detector and the physics analyses, from forward boosted topologies and beam backgrounds. This contribution will detail the impact of beam parameters on beam-induced backgrounds, and provide a first look at what modification compared to e.g. the ILD can improve the physics performance at such a facility. The studies will be benchmarked against some flagship Higgs Factory analyses for comparison.

Alternate track

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