

HALHF: a Hybrid Asymmetric Linear Higgs Factory



Future projects (see dedicated posters):

- linear or circular,
- using radio-frequencies cavities,
- colliding electrons and positrons with same energy.



To discover new particles, we need higher energy. But higher energy requires longer accelerators.

New technology: plasma wake field acceleration (PWFA).

- 20x less distance needed for the same acceleration.
- Potential shorter and cheaper accelerators!





• Still ~10 years of R&D needed (see PWFA exhibition!)

First step is to develop PWFA for electrons, PWFA for positrons will come later.

Using plasma wake-field acceleration, we can shorten the accelerator by a factor ~ 2. Can we shorten even more?

- For a given collision energy, the two beams might have a different energy!
- Example: 250 GeV of collision energy can be achieved with
- 125 GeV electrons and 125 GeV positrons,
- 500 GeV electrons and 31 GeV positrons. \bullet









What detector to build at HALHF?

Before building such an accelerator, we need to make sure that we can study the Higgs in good experimental conditions.

ILC: symmetric collisions





HALHF: asymmetric collisions



All particles are "boosted" towards the right \rightarrow need an asymmetric detector!

As many particles left and right \rightarrow use an symmetric detector