Contribution ID: **737** Type: **Parallel session talk**

A hybrid, asymmetric, linear Higgs factory based on plasma-wakefield and radio-frequency acceleration

Wednesday 23 August 2023 17:05 (15 minutes)

The construction of an electron-positron collider “Higgs factory” has been stalled for a decade,not because of feasibility but because of the cost of conventional radio-frequency (RF) acceleration.
Plasma-wakefield acceleration promises to alleviate this problem via significant cost reduction based on its orders-of-magnitude higher accelerating gradients. However, plasma-based acceleration of
positrons is much more difficult than for electrons. We propose a collider scheme that avoids positron acceleration in plasma, using a mixture of beam-driven plasma-wakefield acceleration to high energy
for the electrons and conventional RF acceleration to low energy for the positrons. We emphasise the benefits of asymmetric energies, asymmetric bunch charges and asymmetric transverse emittances. The implications for luminosity and experimentation at such an asymmetric facility are explored and found to be comparable to conventional facilities; the cost is found to be much lower.

Collaboration / Activity

Future accelerators

Primary author: Prof. FOSTER, Brian (DESY/University of Hamburg)

Co-authors: Dr LINDSTROM, Carl (University of Oslo); Prof. D’ARCY, Richard (University of Oxford)

Presenter: Prof. FOSTER, Brian (DESY/University of Hamburg)

Session Classification: T13 Accelerators for HEP

Track Classification: Accelerators for HEP