

Towards modern electron reconstruction for future Higgs factories

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The precise reconstruction of electrons is an important ingredient for the proposed physics program at future Higgs factories (HF). It becomes especially important in m_W and TGC measurements in the $e\nu W$ final state. These measurements were identified as two of the high-priority focus topics by the WG1 of the ECFA HF study.

The track reconstruction for electrons is particularly challenging due to their increased material interaction probability.

We propose to build a dedicated electron reconstruction algorithm for Key4hep based on state-of-the-art methods from LHC experiments. In particular, a Gaussian sum filter (GSF) based track fit using ACTS and an advanced matching of bremsstrahlung photons will be investigated. This algorithm will be evaluated in a detector-agnostic Key4hep $e\nu W$ benchmark analysis.

In this talk, we present the first results of this work.

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