

# The Triplet Track Trigger Concept for the FCC-hh

A case study to enhance the measurement of Di-Higgs  
Production and  
Higgs Self-Coupling

Dr. Tamasi Kar

Physikalisches Institut, Universität Heidelberg

Several accelerator projects are under study for the post High Luminosity LHC era. The hadron-hadron Future Circular Collider (FCC-hh) is one such project with the goal of colliding proton beams at an unprecedented centre of mass energy of  $\sim 100$  TeV and an instantaneous luminosity of  $\sim 30 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ . Around 1000 simultaneous proton-proton (pp) collisions (pileup) per 25 ns bunch crossing are expected in a luminous region ( $\sim 20$  cm) at the FCC-hh.

I will present the Triplet Track Trigger (TTT) Concept for an FCC-hh detector in this talk. The primary objective of the TTT is to trigger physics at the electroweak scale in real-time by significantly suppressing signals arising from the low energetic pp collisions. I will use the  $HH \rightarrow 4b$  process as a showcase and present a comparison of the trigger performances of the TTT and a calorimeter trigger for the FCC-hh scenario. A possible hardware implementation of the concept will also be outlined.