Charged Particle Optics in Circular Higgs Factory

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Similar to a super B-factory, a circular Higgs factory will require strong focusing systems near the interaction points and a low-emittance lattice in arcs to achieve a factory luminosity. At electron beam energy of 120 GeV, beamstrahlung effects during the collision post an additional challenge to the collider design. In particular, a large momentum acceptance at 2 percent level is necessary to retain an adequate beam lifetime. This turns out to be the most challenging aspect in the design of circular Higgs factory. In my talk, I will use an example [1] to illustrate the beam dynamics in circular Higgs factory, emphasizing on the chromatic optics. Basic optical modules will be introduced and advanced analysis will be presented to identify aberrations that limit the performance of the optics.

References:

[1] Yunhai Cai, SLAC-PUB-16127, October, 2014.