



Contribution ID: 685

Type: **Presentation**

Determination of Luminosity

Tuesday, June 25, 2019 11:30 AM (20 minutes)

For the FCC-ee physics programme, a precise measurement of the luminosity is essential. The high statistics scan of the Z line shape dictates the ambitious goals of 10^{-4} precision on the absolute luminosity measurement and 10^{-5} on the relative luminosity measurement between energy scan points. The reference process for the measurement is small angle Bhabha scattering observed by a set of two calorimeters centered around the two outgoing beam lines. The relevant forward region is a very crowded one, and the very compact silicon-tungsten-sandwich luminometers have their faces positioned only about 1 m from the IP. The Bhabha scattering cross section has a very strong angular dependence, and the geometrical precision of the luminometers shall allow the radial coordinate of showers to be determined to about 1 micron precision. Machine related background processes have been investigated and found to be small. An important effect, which is under study, is the focussing of the final state Bhabha electrons by the strong EM field of the opposing beam resulting in a systematic shift of the scattering angle. It has been found that this effect is correlated with a similar beam-beam effect which causes the beam crossing angle to increase by ~ 0.3 percent. Hence, a precise study of the beam crossing angle via the copiously produced dimoun events will give valuable information on the detailed beam-beam interaction.

Primary author: DAM, Mogens (University of Copenhagen (DK))

Presenter: DAM, Mogens (University of Copenhagen (DK))

Session Classification: FCC physics, experiments & detectors

Track Classification: FCC-ee detector & experiment