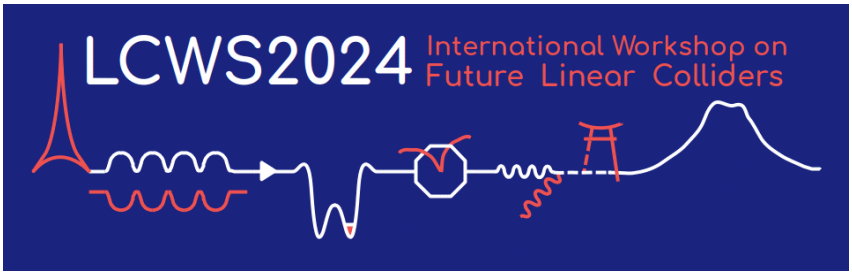

Contribution ID: **215** Type: **Oral presentation (in person)**

Reimagining Linear Collider Luminosity Measurement

Tuesday 9 July 2024 14:40 (20 minutes)

Our recent work has shown that a novel, much higher granularity forward calorimetry concept can enable much more detailed and precise reconstruction than the baseline designs based on LEP luminometers, together with the capability of electron/positron/photon separation.

This new calorimeter concept is designed primarily to maximize the acceptance for $e^+e^- \to \gamma\gamma$ as an alternative luminosity process, where it serves to define the inner edge of the acceptance (there is no outer edge - as the complete detector is used in the measurement), while continuing to provide the standard luminosity measurement from small angle Bhabhas. It will also serve as a general forward electromagnetic calorimeter helping ensure hermeticity and detecting individual electrons, positrons and photons.

In this contribution we will highlight the Bhabha rejection capability in the context of the $e^+e^- \to \gamma\gamma$ luminosity measurement and investigate the utility of a Bhabha "mini-tracker" consisting of a few planes of upstream thin silicon detectors. This will further refine the e^+/e^- polar angle measurement, improve Bhabha rejection (for $\gamma\gamma$), and, last-but-not-least, help mitigate the beam-induced electromagnetic deflection that biases the Bhabha acceptance by providing high precision longitudinal vertex information in Bhabha events than can be used in diagnosing this beam/final-state e^+/e^- effect.

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