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PREPARATION OF CVD DIAMOND DETECTOR FOR FAST LUMINOSITY MONITORING OF SUPERKEKB

The SuperKEKB e^+e^- collider aims to reach a very high luminosity of $8 \times 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$, using highly focused ultra-low emittance bunches colliding every 4ns. To meet the requirement of the dithering feedback system used to stabilise the horizontal orbit of the IP(Interaction Point), a relative precision of 10^{-3} in 1ms is specified for the fast luminosity monitoring, which can be in principle achieved thanks to the large cross section of the radiative Bhabha process. This paper firstly presents the fraction of detected Bhabha scattering positrons with a new beam pipe coupled with a Tungsten radiator installed in LER; Then the characteristics of signals from sCVD diamond detector with thickness of $140\mu\text{m}$ coupled with a broadband current amplifier were studied based on tests with a Sr-90 source; Finally, simulated results for the reconstructed luminosity and the relative precision with different initial luminosities are also reported.

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