



Sensitivity studies on the lepton universality in the channel $\Upsilon(nS) \rightarrow \ell\ell$ via initial-state radiation

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Abstract

1 In this note we present the results of sensitivity studies on the lepton universality
2 in the channel $\Upsilon(nS) \rightarrow \ell\ell$ via initial-state radiation (ISR). The study is performed
3 with Phase III Monte Carlo samples and cover an integrated luminosity range up to
4 the design value of 50 ab^{-1} . This work show that the even with the complete design
5 dataset the statistical uncertainty is not reduced enough to have a competitive
6 measurement.

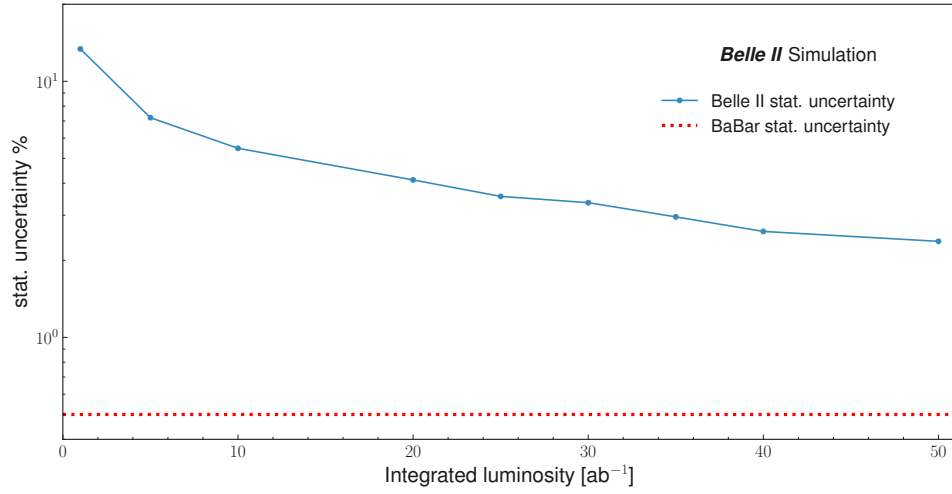


Figure 1: Projection of statistical uncertainty on the cross section of $e^+e^- \rightarrow \gamma_{ISR} (\Upsilon(1S) \rightarrow \tau\tau)$ as a function of the integrated luminosity. The dashed red line shows the statistical uncertainty of the competitive analysis from BaBar [1].

7 References

- 8 [1] J. P. Lees et al. “Precision Measurement of the Ratio $\mathcal{B}(\Upsilon(3S) \rightarrow \tau^+\tau^-)/\mathcal{B}(\Upsilon(3S) \rightarrow$
9 $\mu^+\mu^-)$ ”. In: *Phys. Rev. Lett.* 125 (24 Dec. 2020), p. 241801. DOI: 10.1103/PhysRevLett.
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