

The model dependence of the Monte Carlo simulation and the extraction of the pseudoscalar-photon-photon form factor from data

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The BaBar experiment [1, 2] recently has obtained the information on the high- Q^2 behavior of the differential cross section $d\sigma/dQ^2$ for the “single-tag” process $e^+e^- \rightarrow e^+e^- \pi^0, \eta$ and η' , where the Q^2 is the tagged photon’s virtuality. The pseudoscalar-photon-photon form factors $F(Q^2, 0)$ were extracted from the cross section data [1, 2] and the unexpected high- Q^2 behavior of the pion-photon-photon form factor has lead to very intensive discussions, see [3–11] and references therein. Though the original experimental papers [1, 2] briefly addressed the question of the possible impact of the Monte Carlo simulation model dependence on the form factor extraction from data, there are still debates about this important part of the analysis [9–11]. We stress [11] that a conclusive estimate of such an impact can only be done via a simulation accounting for both photon virtualities in the form factor and having the event selection similar to the experimental one. The details of such a simulation using the Monte Carlo generator EKHARA [12] are presented in this report and can be of importance for the data interpretation and also for new data analyses.

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