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Approved plots : Study of $B \rightarrow K^*\gamma$ decays at Phase III

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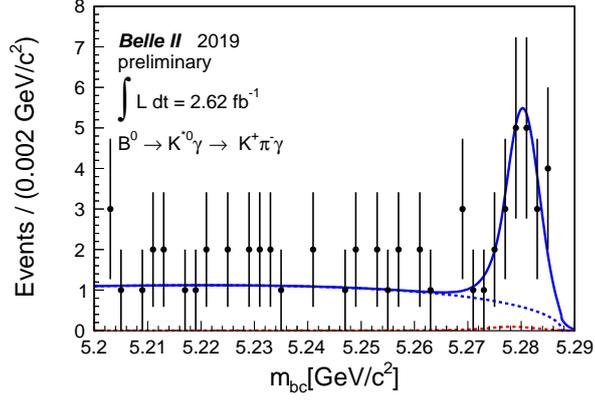


FIG. 1: The beam-constrained mass (m_{bc}) distribution of $B^0 \rightarrow K^{*0}\gamma \rightarrow K^+\pi^-\gamma$ decay candidates in a window $-0.2 \text{ GeV} < \Delta E < 0.08 \text{ GeV}$. The fit contains the following components: an ARGUS function to model background from the continuum and combinatorial B decays (dashed blue line); a Crystal Ball summed with a second ARGUS function to describe peaking backgrounds and higher-mass resonance feed-down (dashed red line); and a Crystal Ball for the signal. The total fit with the signal component is the solid blue line and the data are overlaid as black markers. The signal component has a significance of 4.4σ , and the yield of signal events is found to be 19.1 ± 5.2 (error is statistical only).

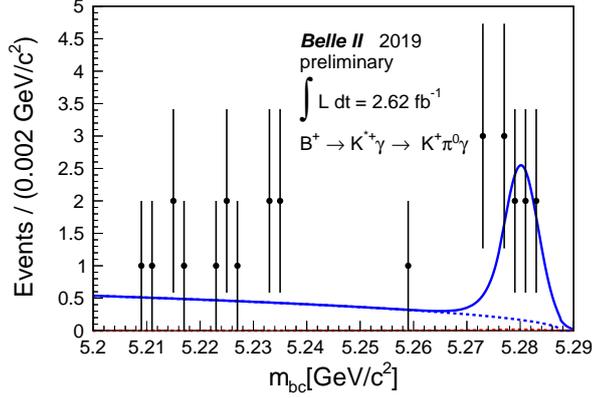


FIG. 2: The beam-constrained mass (m_{bc}) distribution of $B^+ \rightarrow K^{*+}\gamma \rightarrow K^+\pi^0\gamma$ decay candidates in a window $-0.2 \text{ GeV} < \Delta E < 0.08 \text{ GeV}$. The fit contains the following components: an ARGUS function to model background from the continuum and combinatorial B decays (dashed blue line); a Crystal Ball summed with a second ARGUS function to describe peaking backgrounds and higher-mass resonance feed-down (dashed red line); and a Crystal Ball for the signal. The total fit with the signal component is the solid blue line and the data are overlaid as black markers. The signal component has a significance of 3.7σ , and the yield of signal events is found to be 9.8 ± 3.4 (error is statistical only).

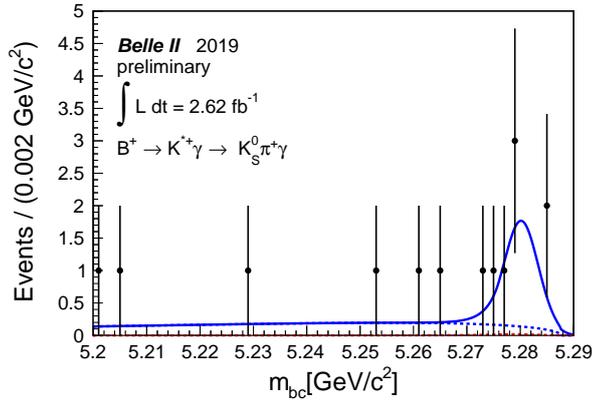


FIG. 3: The beam-constrained mass (m_{bc}) distribution of $B^+ \rightarrow K^{*+}\gamma \rightarrow K_S^0\pi^+\gamma$ decay candidates in a window $-0.2 \text{ GeV} < \Delta E < 0.08 \text{ GeV}$. The fit contains the following components: an ARGUS function to model background from the continuum and combinatorial B decays (dashed blue line); a Crystal Ball summed with a second ARGUS function to describe peaking backgrounds and higher-mass resonance feed-down (dashed red line); and a Crystal Ball for the signal. The total fit with the signal component is the solid blue line and the data are overlaid as black markers. The signal component has a significance of 2.1σ , and the yield of signal events is found to be 6.6 ± 3.1 (error is statistical only).

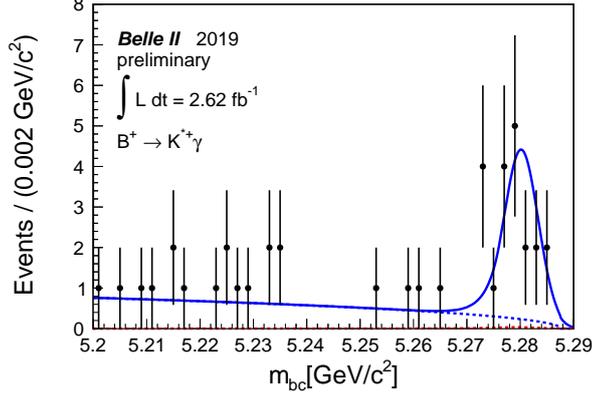


FIG. 4: The beam-constrained mass (m_{bc}) distribution of $B^+ \rightarrow K^{*+}\gamma$ decay candidates in a window $-0.2 \text{ GeV} < \Delta E < 0.08 \text{ GeV}$. The fit contains the following components: an ARGUS function to model background from the continuum and combinatorial B decays (dashed blue line); a Crystal Ball summed with a second ARGUS function to describe peaking backgrounds and higher-mass resonance feed-down (dashed red line); and a Crystal Ball for the signal. The total fit with the signal component is the solid blue line and the data are overlaid as black markers. The signal component has a significance of 4.4σ , and the yield of signal events is found to be 17.0 ± 4.5 (error is statistical only).

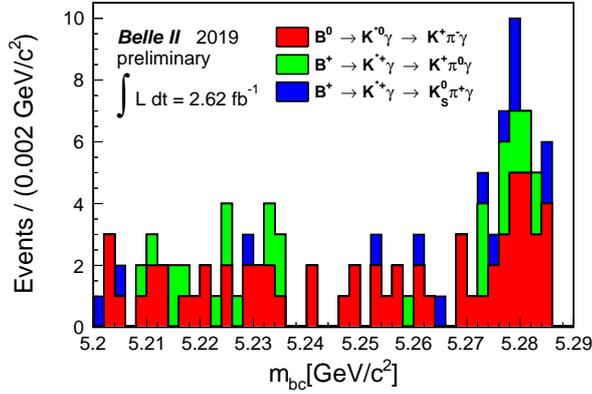


FIG. 5: Stacked histograms of the beam-constrained mass (m_{bc}) distributions for all $B \rightarrow K^*\gamma$ decay candidates, in a window of $-0.2 \text{ GeV} < \Delta E < 0.08 \text{ GeV}$. The red histogram contains $B^0 \rightarrow K^{*0}\gamma \rightarrow K^+\pi^-\gamma$ decay candidates, the green is $B^+ \rightarrow K^{*+}\gamma \rightarrow K^+\pi^0\gamma$, and the blue is $B^+ \rightarrow K^{*+}\gamma \rightarrow K_S^0\pi^+\gamma$.