## Supplemental Material

Figure 1 shows the invariant mass distribution of  $D^+\pi^0$  for the  $D^+\bar{D}^0$  mode (left) and that of  $D^0\pi^0$  for the  $D^0\bar{D}^0$  mode (right), where the  $D^*$  peaks are visible. To help separate the signal events, we require  $M(D^+\pi^0) > 2.1 \text{ GeV}/c^2$  and  $M(D^0\pi^0) > 2.1 \text{ GeV}/c^2$ , as indicated in the Fig. 1.



FIG. 1.  $D\pi^0$  mass spectra of data and inclusive MC background at  $\sqrt{s} = 4.257$  GeV. The solid arrows indicate the minimum requirements on  $M(D\pi^0)$ . The signal processes are arbitrarily scaled. Data at  $\sqrt{s} = 4.226$  GeV show similar distributions and are omitted.

A comparison between the resonance parameters of the  $Z_c(3885)^+$  and the  $Z_c(3885)^0$  is summarized in Table I.

TABLE I. The pole mass  $m_{\text{pole}}$  and width  $\Gamma_{\text{pole}}$  of charged  $Z_c(3885)^+ \to (D\bar{D}^*)^+$  versus those of neutral  $Z_c(3885)^0 \to (D\bar{D}^*)^0$ .

State	$m_{\rm pole}({\rm MeV}/c^2)$	$\Gamma_{\rm pole}({\rm MeV})$	
$Z_c(3885)^+$	$3883.9 \pm 1.5 \pm 4.2$	$24.8 \pm 3.3 \pm 11.0$	Ref. [1]
$Z_c(3885)^+$	$3881.7 \pm 1.6 \pm 2.1$	$26.6 \pm 2.0 \pm 2.3$	Ref. [2]
$Z_c(3885)^0$	$3885.7^{+4.3}_{-5.7}\pm8.4$	$35^{+11}_{-12} \pm 15$	this work

<sup>[1]</sup> M. Ablikim et al. (BESIII Collaboration), Phys. Rev. Lett. 112, 022001 (2014).

<sup>[2]</sup> M. Ablikim *et al.* (BESIII Collaboration), arXiv:1509.01398 [hep-ex].