

Search for the $X(5568)$ state decaying into $B_s^0\pi^\pm$
in proton-proton collisions at $\sqrt{s} = 8$ TeV
— Supplemental Material —

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EFFECT OF $\Delta R(B_s^0, \pi^\pm)$ REQUIREMENT ON THE $M^\Delta(B_s^0\pi^\pm)$ DISTRIBUTION

The D0 Collaboration obtains a significance above five standard deviations for the $X(5568)$ state only when an upper limit on $\Delta R = \sqrt{(\Delta\eta)^2 + (\Delta\phi)^2}$ is imposed, namely, $\Delta R < 0.3$. Here, $\Delta\eta$ and $\Delta\phi$ are the pseudorapidity and azimuthal angle (in radians) differences between the directions of the B_s^0 and π^\pm . As shown in Fig. 1, a requirement on this variable significantly changes the $M^\Delta(B_s^0\pi^\pm)$ distribution and can even produce a peaking shape; therefore, it is not used in this analysis.

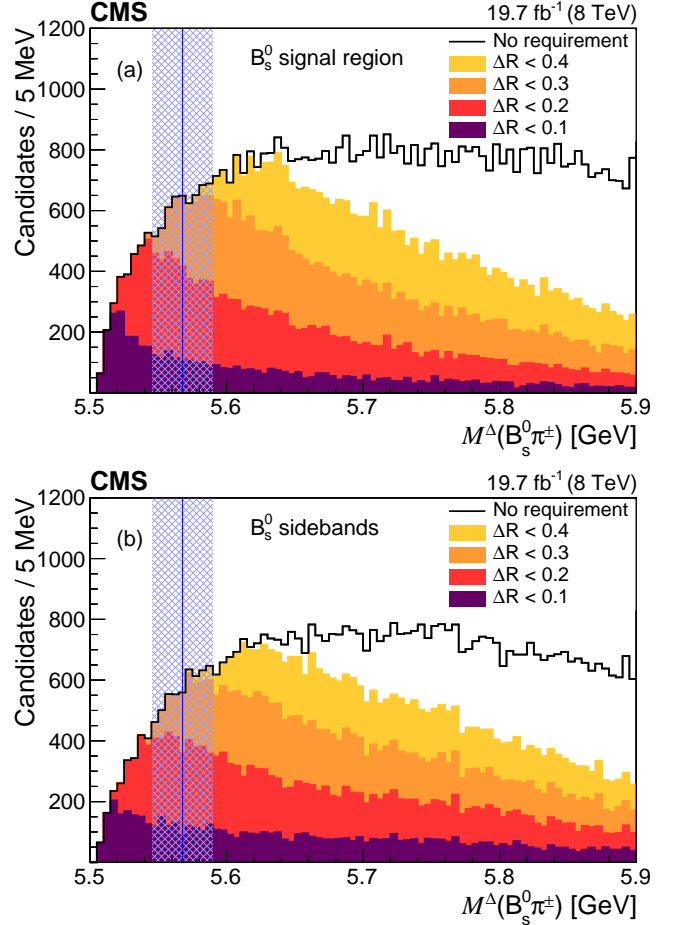


FIG. 1. The $M^\Delta(B_s^0\pi^\pm)$ distributions for events in the B_s^0 (a) signal and (b) sideband regions for different ΔR requirements. The uncertainties are not shown for the sake of clarity. The vertical band indicates the region $m_X \pm \Gamma_X$.