Figure 1: This figure shows the invariant mass distribution of $K_S^0 \to \pi^+\pi^-$ candidates in 1 fb^{-1} of MC (Dress Rehearsal 2) sample containing $q\bar{q}$ ($q = b, c, s, d, u$), $\mu^+\mu^-$ and $\tau^+\tau^-$ events. Events are required to contain at least three good tracks to purify the sample with processes of the type $e^+e^- \to$ hadrons, while rejecting beam induced background, Bhabha scattering, and other low multiplicity background sources. The events are selected with $0.45 < m(\pi^+\pi^-) < 0.55$ GeV/c^2. A vertex fitter based on a Kalman algorithm is used to fit the vertex to reject candidates where the tracks do not originate from near a common decay point. A track quality criteria of > 0.001 is applied on the tracks that originate within the beam pipe. An optimised selection is done in different regions of K_S^0 momentum based on the variables - minimum of the smallest approach of the two daughter tracks, azimuthal angle between momentum and the decay vertex of K_S^0 candidate, distance between two daughter tracks at their interception point and flight length of the K_S^0 candidate. The internal document reference is BELLE2-NOTE-PH-2018-017.
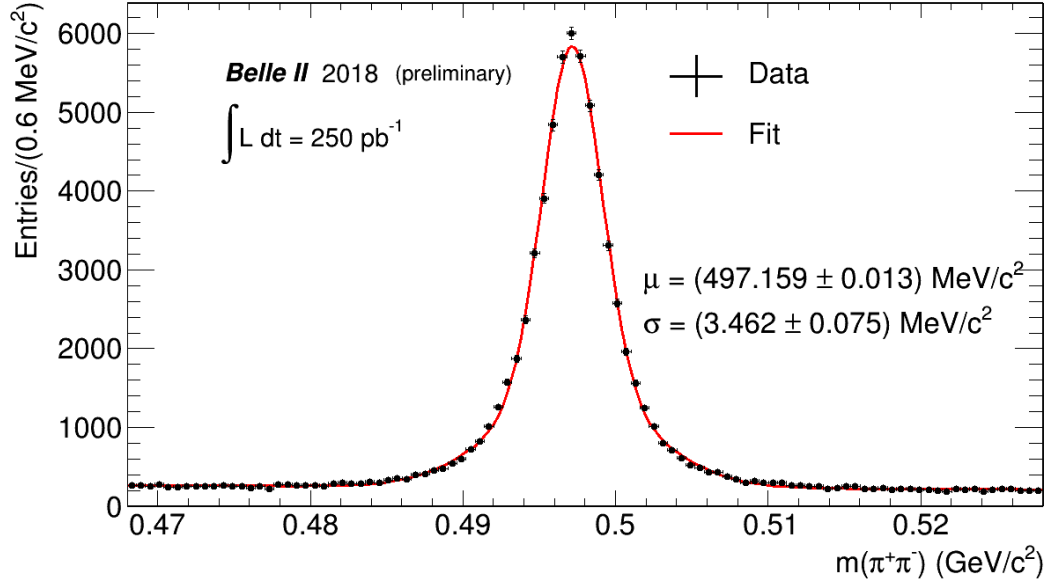
Figure 2: This figure shows the invariant mass distribution of $K_S^0 \to \pi^+\pi^-$ candidates in 250 pb^{-1} of collision data. Events are required to contain at least three good tracks to purify the sample with processes of the type $e^+e^- \to$ hadrons, while rejecting beam induced background, Bhabha scattering, and other low multiplicity background sources. The events are selected with $0.45 < m(\pi^+\pi^-) < 0.55$ GeV/c^2. A vertex fitter based on a Kalman algorithm is used to fit the vertex to reject candidates where the tracks do not originate from near a common decay point. A track quality criteria of > 0.001 is applied on the tracks that originate within the beam pipe. An optimised selection is done in different regions of K_S^0 momentum based on the variables - minimum of the smallest approach of the two daughter tracks, azimuthal angle between momentum and the decay vertex of K_S^0 candidate, distance between two daughter tracks at their interception point and flight length of the K_S^0 candidate. The internal document reference is BELLE2-NOTE-PH-2018-017.