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# Rediscovery of the $D^0 \rightarrow K_S^0 K_S^0$ decay with early Belle II data

The Belle II Collaboration

The decay  $D^0 \rightarrow K_S^0 K_S^0$  is among the most interesting modes for the understanding of  $CP$  violation in charm decays. This note reports the “rediscovery” of this decay in the data sample collected by Belle II during 2019 and the first half of 2020, and corresponding to  $37.8 \text{ fb}^{-1}$  of integrated luminosity.

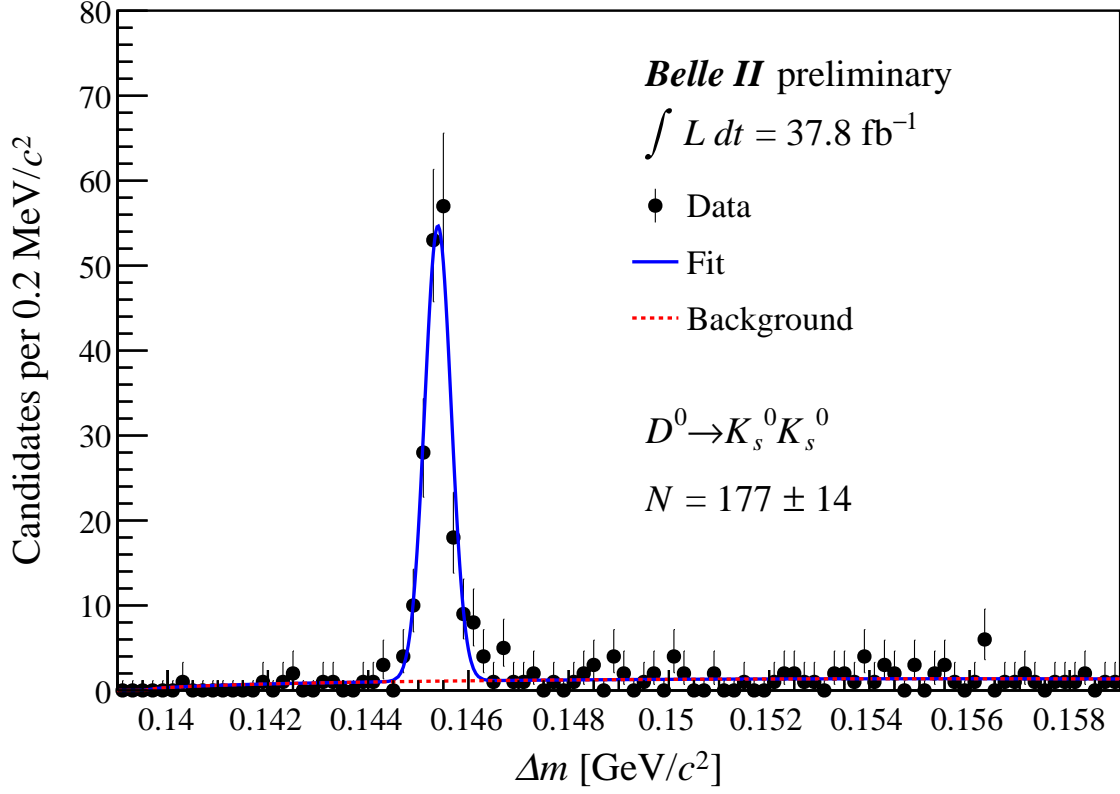


Figure 1: Distribution of the difference between the  $D^{*+}$  and  $D^0$  masses ( $\Delta m$ ) of  $D^{*+} \rightarrow D^0(\rightarrow K_s^0 K_s^0)\pi^+$  candidates reconstructed in the data collected by Belle II during 2019 and the first half of 2020, and corresponding to an integrated luminosity of  $37.8 \text{ fb}^{-1}$ , with fit projection overlaid. The  $\Delta m$  distribution is only for candidates populating the signal region  $1.845 < m(K_s^0 K_s^0) < 1.885 \text{ GeV}/c^2$ . The signal yield per integrated luminosity is consistent with that observed by Belle; the  $\Delta m$  peak resolution and the signal purity are better than those observed by Belle [1].

## References

- [1] N. Dash et al., Belle collaboration, *Search for CP violation and measurement of the branching fraction in the decay  $D^0 \rightarrow K_s^0 K_s^0$* , Phys. Rev. Lett. **119** (2017) 171801, arXiv:1705.05966 [hep-ex].