\[ D_s^{*+} \rightarrow D_s^+ e^+ e^- \]

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Contents

\*DsGamma

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Delta m Cut, as directly copied from the Ds*→Ds e+e- reconstruction is too narrow for the Ds*→Ds gamma reconstruction. It could drop events where the photon’s reconstruction is not well modeled in Monte Carlo. Hence we widened the cut to between 120 and 140 MeV.

Standard dm Cut
• The cut efficiency is found to be 18.9 %.

Widened dm Cut
• The cut efficiency is found to be 29.0%
Ds* $\rightarrow$ Ds gamma Channel

$\delta m$ Distribution in Wrong-Sign $D_s \rightarrow KK\pi$

<table>
<thead>
<tr>
<th>h_DeltaM_wrongConver</th>
<th>Entries</th>
<th>Mean</th>
<th>RMS</th>
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<td>Entries</td>
<td>557760</td>
<td>0.1077</td>
<td>0.03881</td>
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Ds* -> Ds gamma Channel

Standard dm Cut
• #Signal Events = 4345
• I infer B(Ds*->Ds gamma) = 0.75 ± 0.05

Widened dm Cut
• #Signal Events = 6702
• I infer B(Ds*->Ds gamma) = 0.76 ± 0.05.

• The PDG value is 0.942 ± 0.007.
Ds* -> Ds gamma Channel

- We start with a Ds*+ -> Ds+ gamma sample and reconstruct the Ds** through the Ds+.
- The Ds- on the other side is decaying generically.
- Plot fitted to a double-shouldered Crystal Ball function standing on an Argus function.

### Standard dm Cut
- The cut efficiency is found to be 19.2%.

### Widened dm Cut
- The cut efficiency is found to be 29.8%
We start with a $D_{s}^{*+} \rightarrow D_{s}^{+}$ gamma sample and reconstruct the $D_{s}^{*+}$ through the $D_{s}^{-} \rightarrow K K \pi$.
Ds* $\rightarrow$ Ds gamma Channel

**Standard dm Cut**
- #Signal Events = 4853
- I infer $\text{B}(\text{Ds}^* \rightarrow \text{Ds gamma}) = 0.83 \pm 0.05$.

**Widened dm Cut**
- #Signal Events = 8051
- I infer $\text{B}(\text{Ds}^* \rightarrow \text{Ds gamma}) = 0.89 \pm 0.06$. 