D_{s} Hadronic BF Update

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General Status

• Single tag yield extraction was updated a while ago
  - now includes parametrization of background shape from generic MC; $\chi^2$ of fits improved

• Have been stuck on what to update for double tags
  - reminder: yields are obtained from a signal region in $M(D_s)$ vs $M(D_s^\pm)$ space, backgrounds from sidebands at same $M(D_s) + M(D_s^\pm)$ - “cut and count”
  - backgrounds have significant structure in the mass plot; 2D fits are be tricky (and for modes with small yields the statistical error is hard to interpret)
  - Loose cuts on candidates mean lots of background especially in newer modes (e.g. $\omega\pi$).
Example of DT plane
Possible Improvements

- We can use additional kinematic rejection on our events, at the expense of some efficiency (and related systematic)
  - Only consider for dirty DT modes
- Option 1: recoil mass\(^2\) of \(D_s \bar{D}_s\) system should be 0 (except for \(D_s^* \rightarrow D_s \pi^0\) and ISR)
- Option 2: at least one \(D_s\) candidate should be near recoil mass of \(M(D_s^*)\) (except for ISR)
$D_s \bar{D}_s$ recoil mass

KKpi vs KKpi

(Some modes are much worse!)
Recoil mass of each $D_s$

KKpi vs KKpi

Generic MC

Continuum MC
DT signal for $\omega \pi$

$D_s^+ \rightarrow \pi^+ \omega$, $\omega \rightarrow \pi^+ \pi^- \pi^0$ / $D_s^- \rightarrow K^+ K^- \pi^-$

Nice to see...