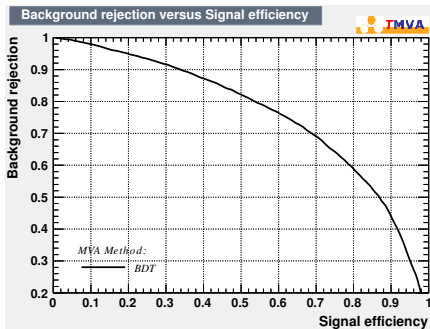
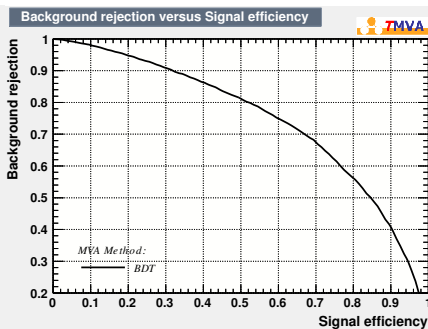


- From last week, work with BDT3.
- Variables used:
  - $\Lambda_c^+$  vertex  $\chi^2$
  - $\Lambda_c^+$  DOCAMAX
  - $\Lambda_c^+$  DIRA
  - $\Lambda_c^+$   $p_T$
  - nSPDHits
- Lacking nSPDHits in current simulation tuples, have trained new BDT4 without nSPDHits.
- BDT architecture fairly standard - 100 trees, adaptive boosting

# BDT performance



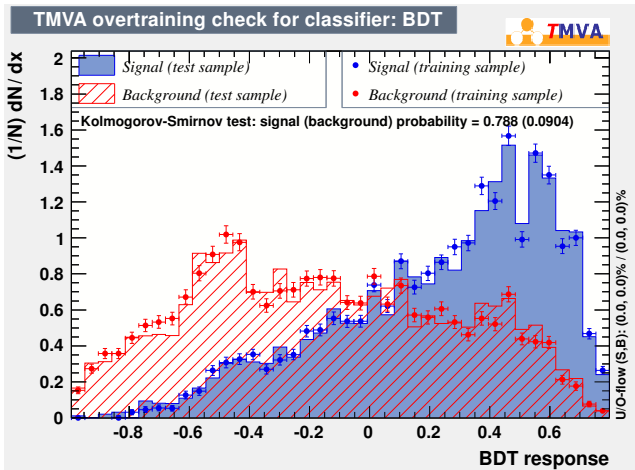
BDT3



BDT4

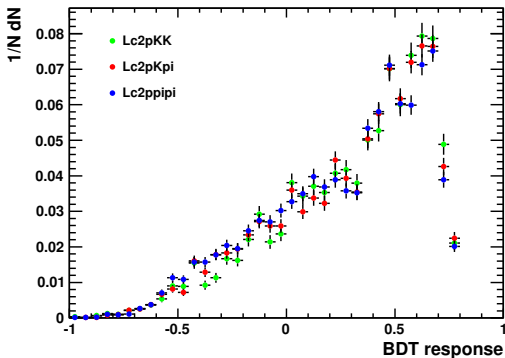
- BDT4 performance slightly decreased with respect to BDT3.

# BDT overtraining



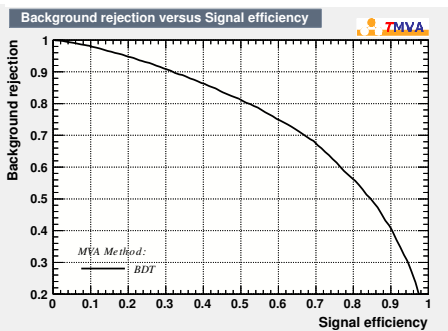
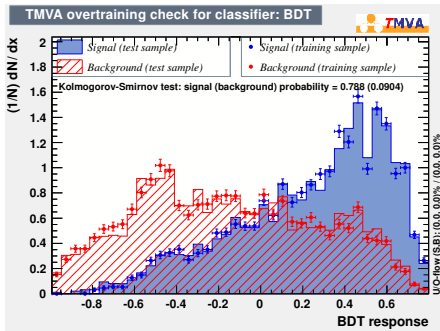
- No significant overtraining with these training and testing samples.

# BDT response in simulation



- Some observable differences.
- $\chi^2$ - test p-values for:
  - $\Lambda_c^+ \rightarrow pK^- \pi^+$  vs  $\Lambda_c^+ \rightarrow pK^- K^+$ : 0.279
  - $\Lambda_c^+ \rightarrow pK^- \pi^+$  vs  $\Lambda_c^+ \rightarrow p\pi^- \pi^+$ : 0.086
  - $\Lambda_c^+ \rightarrow pK^- K^+$  vs  $\Lambda_c^+ \rightarrow p\pi^- \pi^+$ :  $4.47 \times 10^{-5}$

# BDT phase-space averaged efficiencies



## ● Efficiencies of a BDT response cut $> 0$ :

- $\Lambda_c^+ \rightarrow pK^- \pi^+$ :  $(78.08 \pm 0.49)\%$
- $\Lambda_c^+ \rightarrow pK^- K^+$ :  $(79.98 \pm 0.53)\%$
- $\Lambda_c^+ \rightarrow p\pi^- \pi^+$ :  $(76.25 \pm 0.48)\%$