$B \to K\ell\ell$ update

Marcin Chrząszcz
Gośka Pikies

University of Zurich[UZH]

$R(K)$ meeting, CERN
March 01, 2016

Feature engineering

� We wanted to align the training with $B \to Kee$.
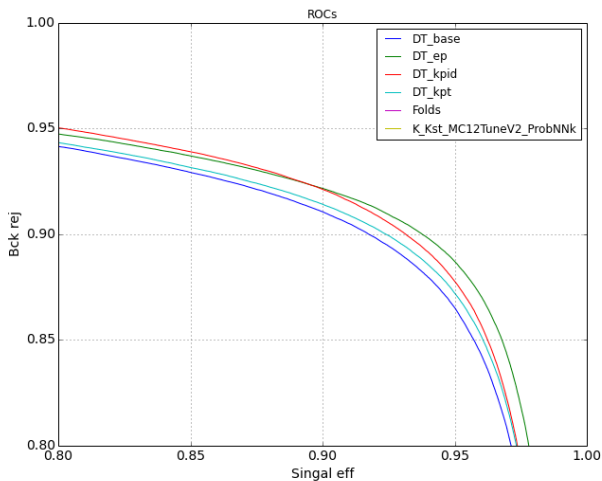The base is:

- K_Kst_IPCHI2_OWNPV
- B_plus_ENDVERTEX_CHI2
- e_minus_IPCHI2_OWNPV
- e_plus_IPCHI2_OWNPV
- B_plus_PT
- B_plus_IPCHI2_OWNPV
- B_plus_FD_OWNPV
- B_plus_DIRA_OWNPV
- B_plus_P
- K_Kst_P
- e_plus_TRACK_CHI2NDOF
- e_minus_TRACK_CHI2NDOF
- K_Kst_TRACK_CHI2NDOF

� In addition we have extensions:

- K_Kst_MC12TuneV2_ProbNNk (kpid)
- K_Kst_PT (kpt, ep)
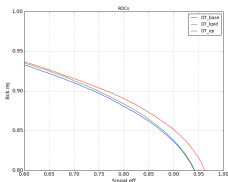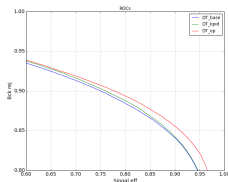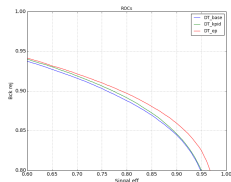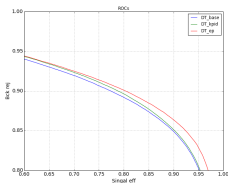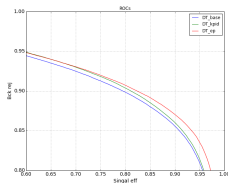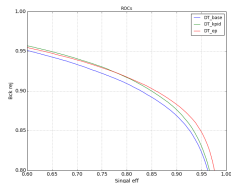- e_plus_PT (ep)
- e_minus_PT (ep)
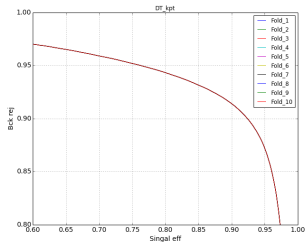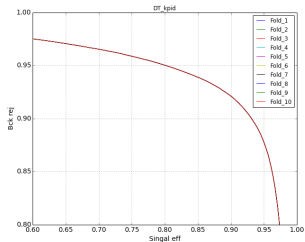
Performance

⇛ The performance of the training (10-Fold training)
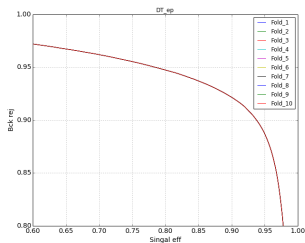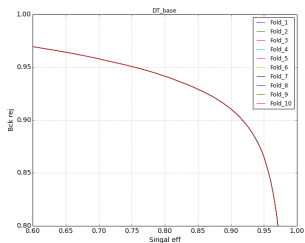
Put or not to put PIDK in BDT

$\Rightarrow$ Cuts: `K_Kst_MC12TuneV2_ProbNNk` $> 0.1, 0.2, 0.3, 0.4, 0.5, 0.6$.
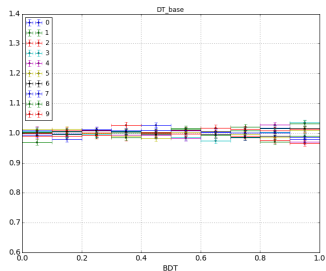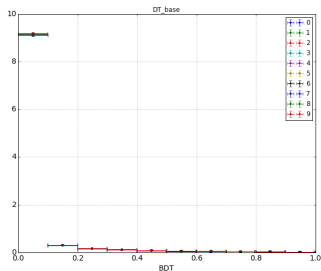
Fold consistency

⇛ Comparison of the ROC curves

Distribution consistency

⇛ Comparison of the Distributions (base):

Distribution consistency

$\Rrightarrow$ Comparison of the Distributions (kpid):
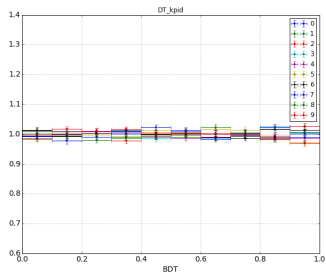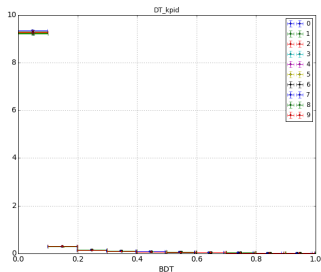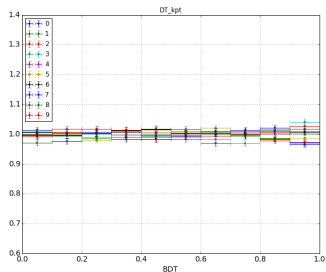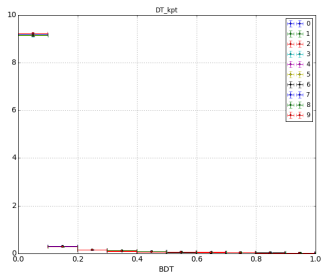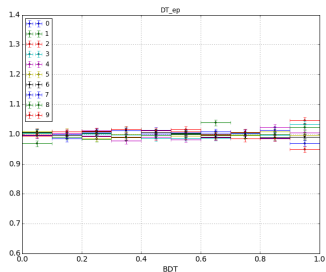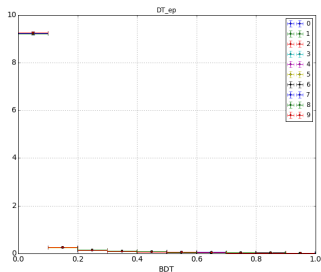
Distribution consistency

⇛ Comparison of the Distributions (kpt):

Distribution consistency

⇛ Comparison of the Distributions (ep):

Conclusions

- Large portion of efficiency gain of `K_Kst_MC12TuneV2_ProbNNk` inside the BDT can be recovered by applying a `K_Kst_MC12TuneV2_ProbNNk` cut.

- I would still *go* with putting it inside the BDT, as it makes life easier.

- See what other people working in this say.

Backup