

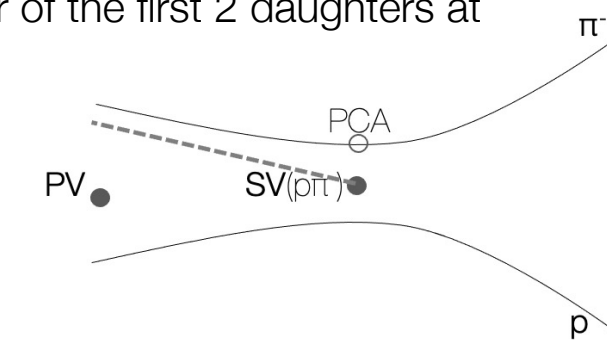
# Hypernuclei 3-body decay with PFSimple (KFPparticle)

## Reconstruction algorithm

example:  ${}^3_{\Lambda}\text{H} \rightarrow \text{d} + \text{p} + \pi^{-}$

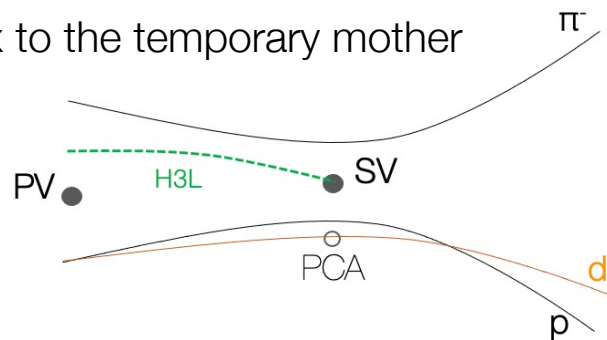
1<sup>st</sup> step: 1<sup>st</sup> & 2<sup>nd</sup> daughter

- reconstruction of a temporary mother of the first 2 daughters at their secondary vertex

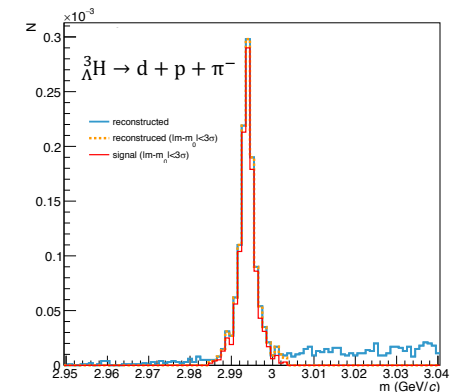
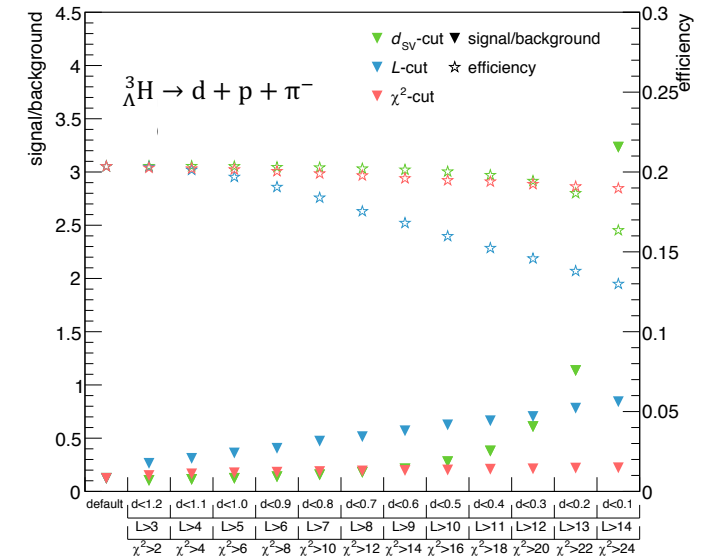


2<sup>nd</sup> step: 3<sup>rd</sup> daughter

- add 3<sup>rd</sup> daughter at secondary vertex to the temporary mother



## cut optimization

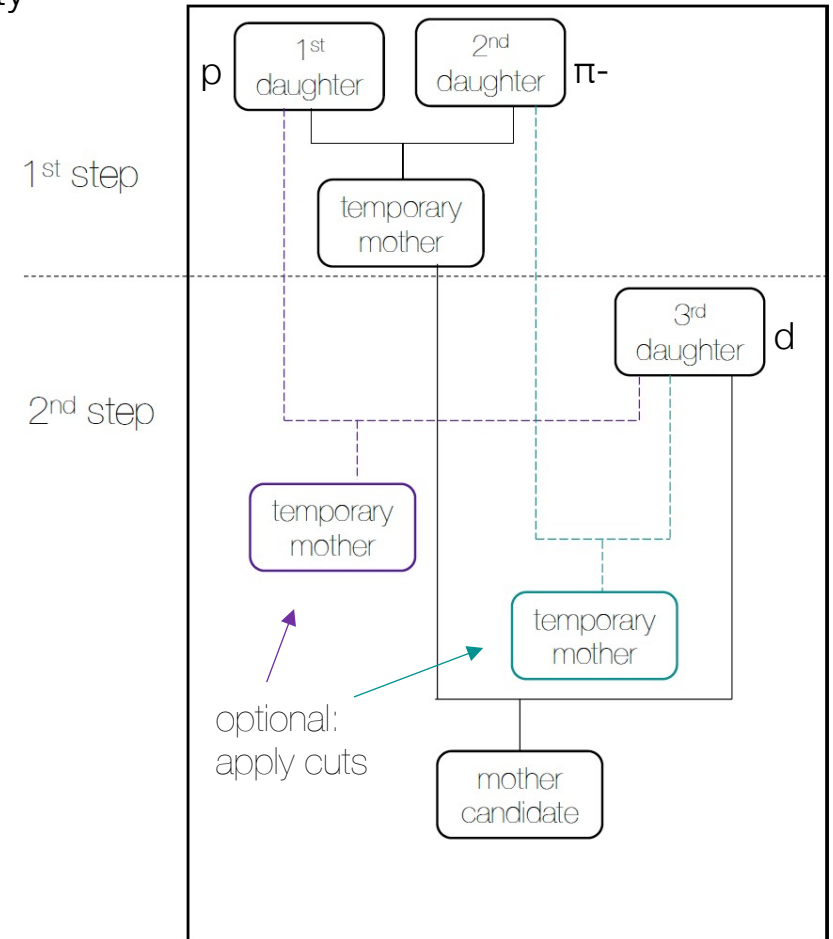
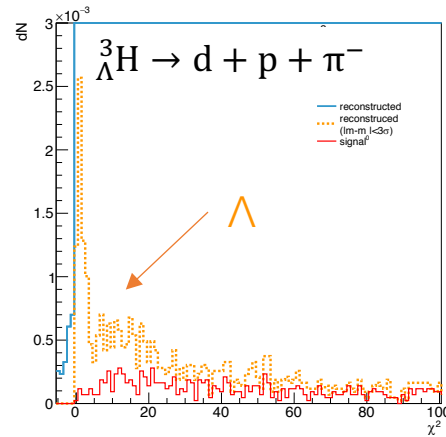
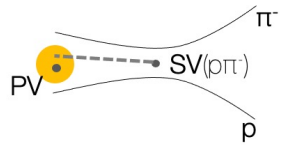


# Hypernuclei 3-body decay with PFSimple (KFParticle)

3-body reconstruction with same approach as in KFParticleFinder with more flexibility

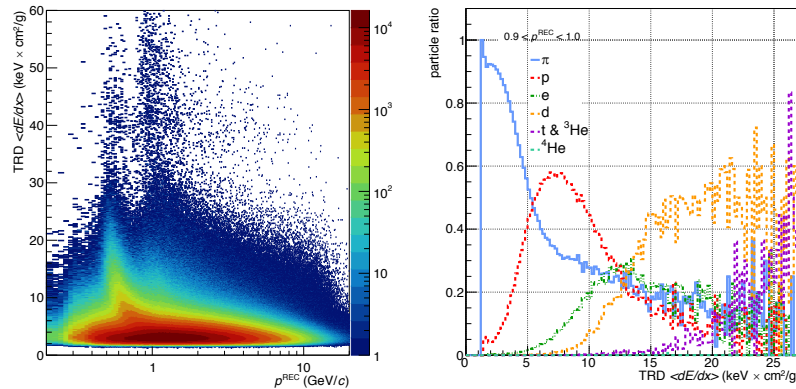
- user can select sequence of adding daughters
- cuts can also be applied on temporary mothers formed by daughter 2 & 3 or daughter 1 & 3

$\chi^2$  topo of temporary mother of  $p$  &  $\pi^-$



TRD-dE/dx-cut for daughter PIDs:

- user can select minimum purities for daughters in dE/dx-pxq-bins



Also used as input for machine learning with XGBoost model.