

Reconstruction of $200,000 K_L + p \rightarrow K_S + p$ with uniformly distributed K_L momentum using reaction filter

```
hd_root --nthreads=8 -PTRIG:BYPASS=1
-PEVENTRFBUNCH:USE_TAG=KLong
-PVERTEX:USEWEIGHTEDAVERAGE=1 -PVERTEX:USE_KLONG_VERTEX=1
-PPLUGINS=monitoring_hists,ReactionFilter
-PRReaction1=10_14__16_14
-PRReaction1:Flags=B0_M16
```

(1) Meaning of Flags=B0_M16 ?

Number of events in the filtered tree_ks_B0_M16.root

=**11,429** out of **200,000** generated reactions

Klong 0.1>T GeV (p>)

X: -empty-	NumBeam	ChargedHypo_X4_Measured	ChargedHypo_ExtrapolatedY_DIRC	PiMinus_ChiSq_Timing_KinFit
Y: -empty-	Beam_PID	ChargedHypo_P4_Measured	ChargedHypo_ThetaC_DIRC	PiMinus_P4_KinFit
Z: -empty-	Beam_IsGenerator	ChargedHypo_PIDFOM	ChargedHypo_Lele_DIRC	PiMinus_X4_KinFit
✂ -empty-	Beam_X4_Measured	ChargedHypo_NDF_Tracking	ChargedHypo_Lpi_DIRC	PiPlus_ChargedIndex
📦 Scan box	Beam_P4_Measured	ChargedHypo_ChiSq_Tracking	ChargedHypo_Lk_DIRC	PiPlus_Beta_Timing_Measured
E() -empty-	NumNeutralHyps	ChargedHypo_NDF_DCdEdx	ChargedHypo_Lp_DIRC	PiPlus_ChiSq_Timing_Measured
E() -empty-	NeutralHypo_NeutralID	ChargedHypo_ChiSq_DCdEdx	NumUnusedTracks	PiPlus_Beta_Timing_KinFit
E() -empty-	NeutralHypo_PID	ChargedHypo_dEdx_CDC	NumCombos =1 mostly	PiPlus_ChiSq_Timing_KinFit
E() -empty-	NeutralHypo_ThrownIndex	ChargedHypo_dEdx_CDC_integral	IsComboCut	PiPlus_P4_KinFit
E() -empty-	NeutralHypo_X4_Measured	ChargedHypo_dEdx_FDC	IsTrueCombo True PID?	PiPlus_X4_KinFit
E() -empty-	NeutralHypo_P4_Measured	ChargedHypo_HitTime	ISBDTSIGNALCombo	
E() -empty-	NeutralHypo_Beta_Timing	ChargedHypo_RFDeltaTVar	RTime_Measured	
E() -empty-	NeutralHypo_ChiSq_Timing	ChargedHypo_Beta_Timing	ChiSq_KinFit	
E() -empty-	NeutralHypo_NDF_Timing	ChargedHypo_ChiSq_Timing	NDF_KinFit	
E() -empty-	NeutralHypo_X4_Shower	ChargedHypo_NDF_Timing	NumUnusedShowers	
RunNumber	NeutralHypo_ShowerQuality	ChargedHypo_dEdx_TOF	Energy_UnusedShowers	
EventNumber	NeutralHypo_ShowerTOF_FCAL_match	ChargedHypo_dEdx_ST	NumUnusedShowers_Quality	
L1 TriggerBits	NeutralHypo_ShowerTOF_FCAL_x_min	ChargedHypo_Energy_BCAL	Energy_UnusedShowers_Quality	
L1 BCAL Energy	NeutralHypo_ShowerTOF_FCAL_y_min	ChargedHypo_Energy_BCALPreshower	SumPMag_UnusedTracks	
L1 FCAL Energy	NeutralHypo_Energy_BCAL	ChargedHypo_SigLong_BCAL	SumP3_UnusedTracks	
X4_Production	NeutralHypo_Energy_BCALPreshower	ChargedHypo_SigTheta_BCAL	ComboBeam_BeamIndex	
ThrownBeam_PID	NeutralHypo_SigLong_BCAL	ChargedHypo_SigTrans_BCAL	ComboBeam_P4_KinFit	
ThrownBeam_X4	NeutralHypo_SigTheta_BCAL	ChargedHypo_RMSTime_BCAL	ComboBeam_X4_KinFit	
ThrownBeam_P4	NeutralHypo_SigTrans_BCAL	ChargedHypo_Energy_FCAL	Proton_ChargedIndex	
ThrownBeam_GeneratedEnergy	NeutralHypo_RMSTime_BCAL	ChargedHypo_E1E9_FCAL	Proton_Beta_Timing_Measured	
NumPIDThrown_FinalState	NeutralHypo_Energy_FCAL	ChargedHypo_E9E25_FCAL	Proton_ChiSq_Timing_Measured	
PIDThrown_Decaying	NeutralHypo_Energy_CCAL	ChargedHypo_SumU_FCAL	Proton_Beta_Timing_KinFit	
MCWeight	NeutralHypo_TrackBCAL_DeltaPhi	ChargedHypo_SumV_FCAL	Proton_ChiSq_Timing_KinFit	
NumThrown	NeutralHypo_TrackBCAL_DeltaZ	ChargedHypo_NumBlocks_FCAL	Proton_P4_KinFit	
Thrown_ParentIndex	NeutralHypo_TrackFCAL_DOCA	ChargedHypo_Energy_CCAL	Proton_X4_KinFit	
Thrown_PID	NeutralHypo_TrackFCAL_DeltaT	ChargedHypo_TrackBCAL_DeltaPhi	DecayingKShort_X4	
Thrown_MatchID	NeutralHypo_PhotonRFDeltaTVar	ChargedHypo_TrackBCAL_DeltaZ	DecayingKShort_PathLengthSigma	
Thrown_MatchFOM	NumChargedHyps	ChargedHypo_TrackFCAL_DOCA	PiMinus_ChargedIndex	
Thrown_X4	ChargedHypo_TrackID	ChargedHypo_TrackFCAL_DeltaT	PiMinus_Beta_Timing_Measured	
Thrown_P4	ChargedHypo_PID	ChargedHypo_NumPhotons_DIRC	PiMinus_ChiSq_Timing_Measured	
IsThrownTopology	ChargedHypo_ThrownIndex	ChargedHypo_ExtrapolatedX_DIRC	PiMinus_Beta_Timing_KinFit	

“..._P4_KinFit” used to calculate
 $EM(\pi^+ \pi^-)$ for K_s
 $MM(\pi^+ \pi^-)$ for p
 $MM(\pi^+ \pi^-)$ for X

“X4_Production” used to show
 Reaction vertex xyz coordinates(?)
 and time (beam TOF?)





