Preparations for analysis of $B_s \rightarrow J/\psi\phi$ decays on Run 2 data

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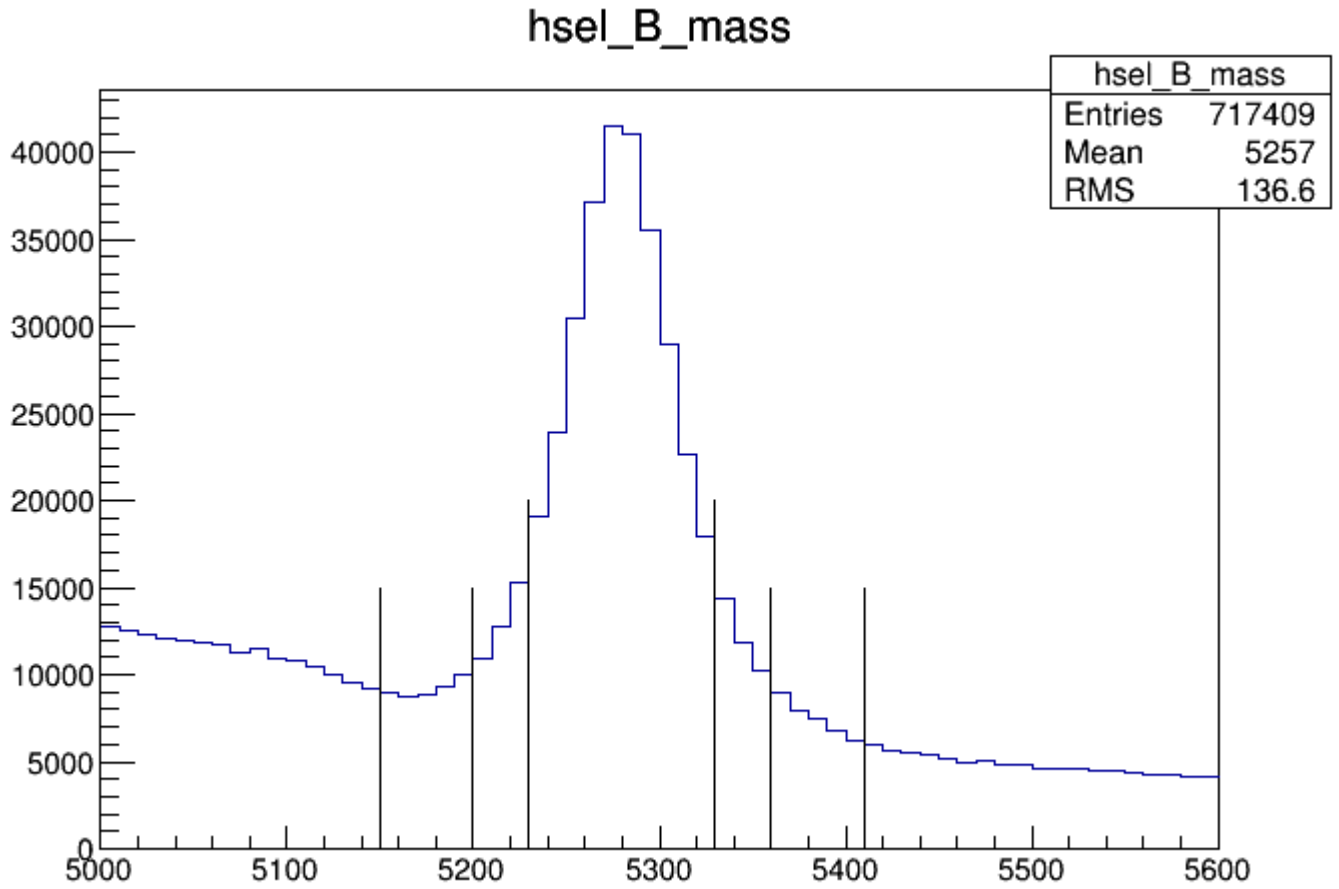
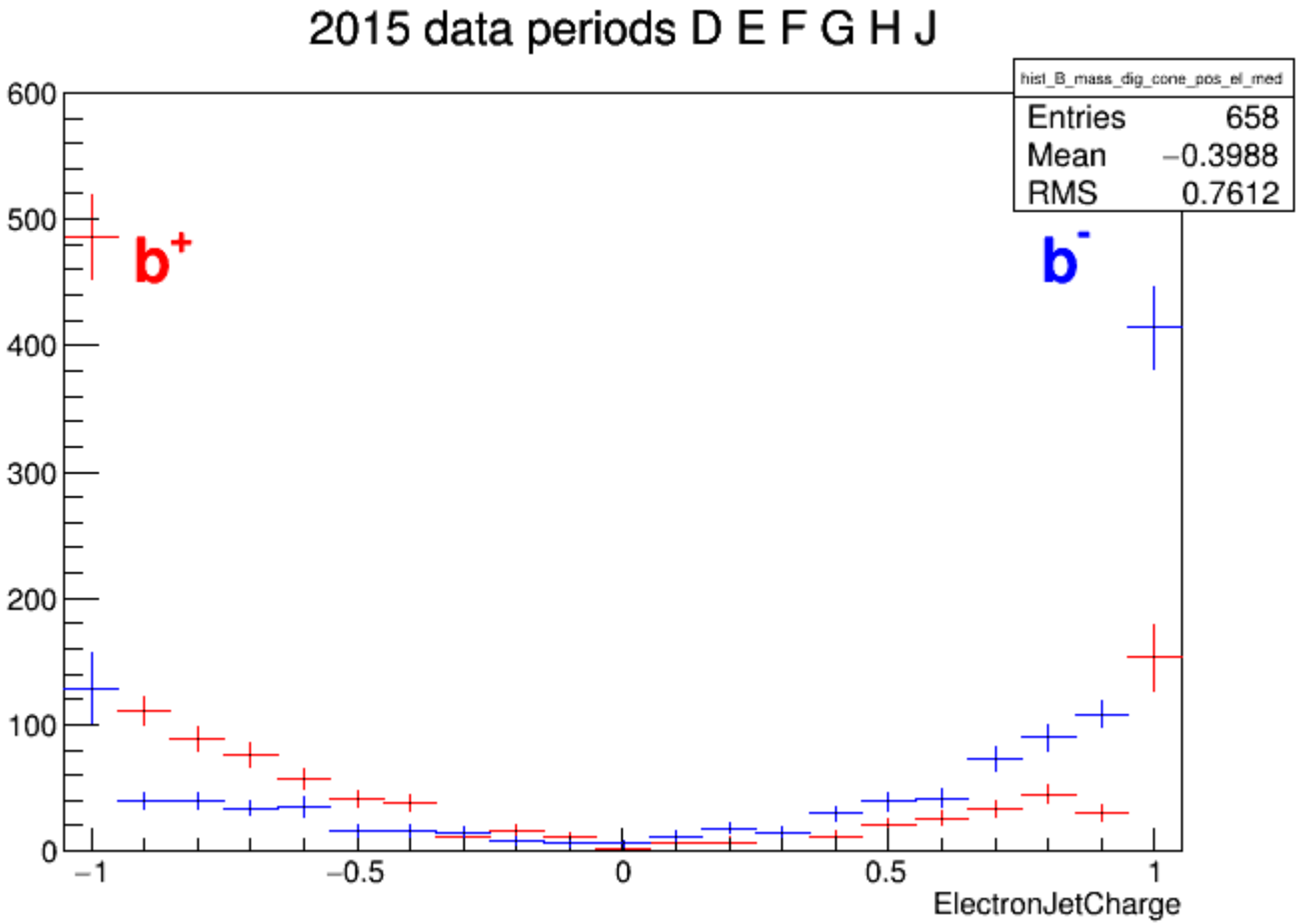
IHEP Protvino

B^{+-} candidates at 13 TeV, τ>0.4 ps used for calibration of Tagging efficiency



ElectronJetCharge with Medium electrons



Medium ElectronsJetCharge with GRL (AllGood)

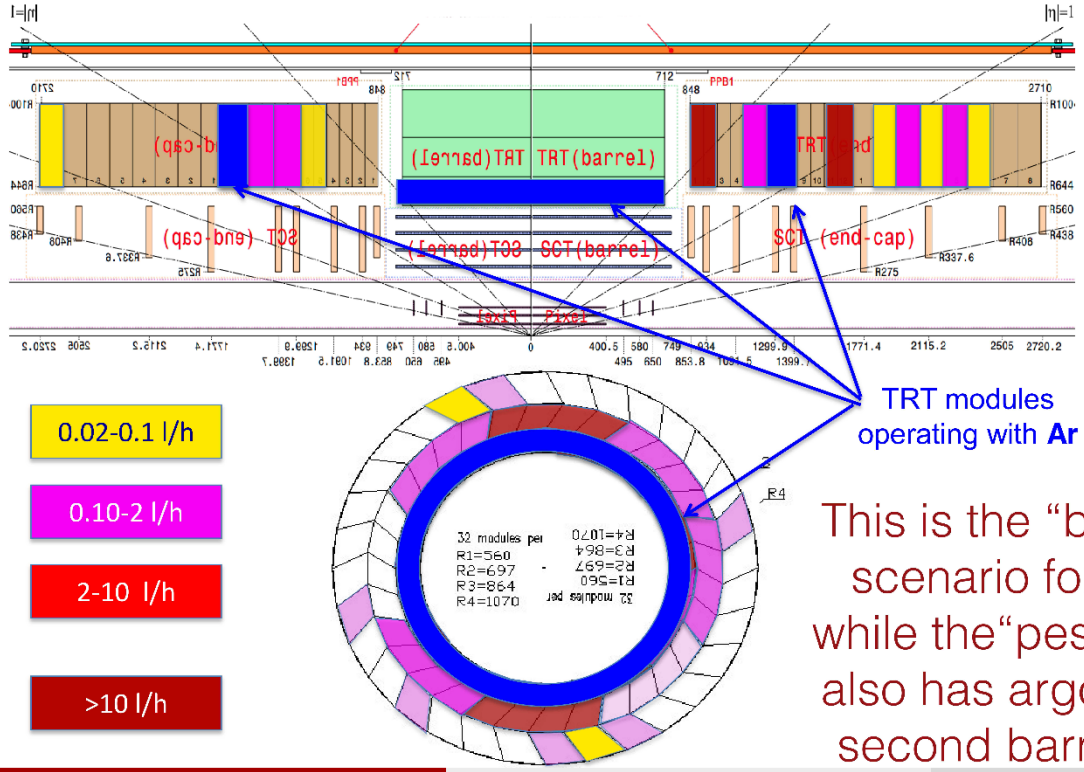
- Used BPHY5 NTuples produced by James Walder
- Tau(B) > 0.4 ps; VxFit χ^2 <12 (NDF = 5)
- Cos(Angle(B, El)) < 0.98 (rejected electrons in 11 degrees cone around B mom.
- R(cone) = 0.5; |z0|<5 mm; Track charges weighted with track p_t

Period	N(B+-) with GRL	N Electr	Efficiency, %	Dilution, %	Tag Power, %
2015 D	6329	88	1.39±0.14	0.227±0.060	0.072±0.028
2015 E	37932	380	1.00±0.05	0.568±0.039	0.324±0.036
2015 F	25708	277	1.08±0.06	0.430±0.043	0.199±0.030
2015 G	60935	727	1.19±0.04	0.409±0.026	0.199±0.019
2015 H	19340	234	1.21±0.08	0.481±0.047	0.287±0.044
2015 J	64627	757	1.17±0.04	0.432±0.025	0.218±0.020
Total	214871	2463	1.15±0.02	0.444±0.014	0.225±0.011

Backup slides

Changes in the TRT: Different gas scenarios

Due to increased cost caused by leakage of the Xenon gas in the TRT, the full Xe gas(left) has now been replaced by a Xenon-Argon mixture(right).



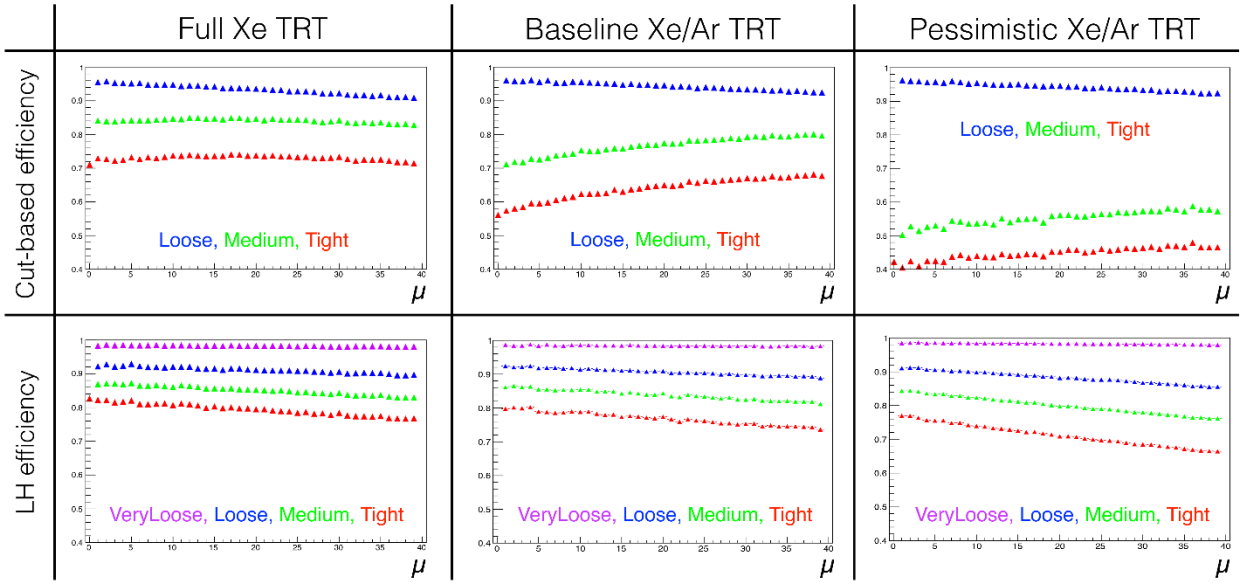
This is the "baseline" scenario for 2015, while the"pessimistic" also has argon in the second barrel layer

Slide from EGamma workshop on 10 Nov 2015

Optimization method for TRT PID

Efficiency of electron ID dropped due to change in the TRT gas (fig. below). Two step process to replace f_{HT} by eProbabilityHT (cut-based):

- Find efficiency only due to the f_{HT} cut using full Xe samples.
- Scan through the distribution for eProbabilityHT, propose a cut with the same efficiency using the Xe-Ar baseline samples.



Backup Medium Electrons without Cone with GRL (AllGood)

- Used BPHY5 NTuples produced by James Walder
- Tau(B) > 0.4 ps; VxFit χ^2 <12
- Cos(Angle(B, El)) < 0.98

Period	N(B+-) no GRL	N(B+-) with GRL	N Electr	Efficiency, %	Dilution, %	Tag Power, %
2015 D	7057	6329	90	1.42±0.14	0.222±0.118	0.070±0.053
2015 E	46758	37932	381	1.00±0.05	0.553±0.049	0.308±0.042
2015 F	27418	25708	279	1.08±0.06	0.419±0.062	0.190±0.041
2015 G	62125	60935	729	1.19±0.04	0.404±0.039	0.195±0.027
2015 H	40013	19340	234	1.20±0.07	0.470±0.064	0.267±0.054
Total	183371	150244	1713	1.14±0.02	0.439±0.024	0.220±0.018

$B_d^0 \rightarrow J/\psi K^* \rightarrow J/\psi K^+ \pi^-$ (τ>0.4 ps) run 283270 with BPHY7 Derivation (provided by Adam)