



*$B_s(d) \rightarrow K^{*0} K^{*0} DC06$*
preselection proposal

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PROGRAMA NACIONAL DE
BECAS FPU¹

Introduction



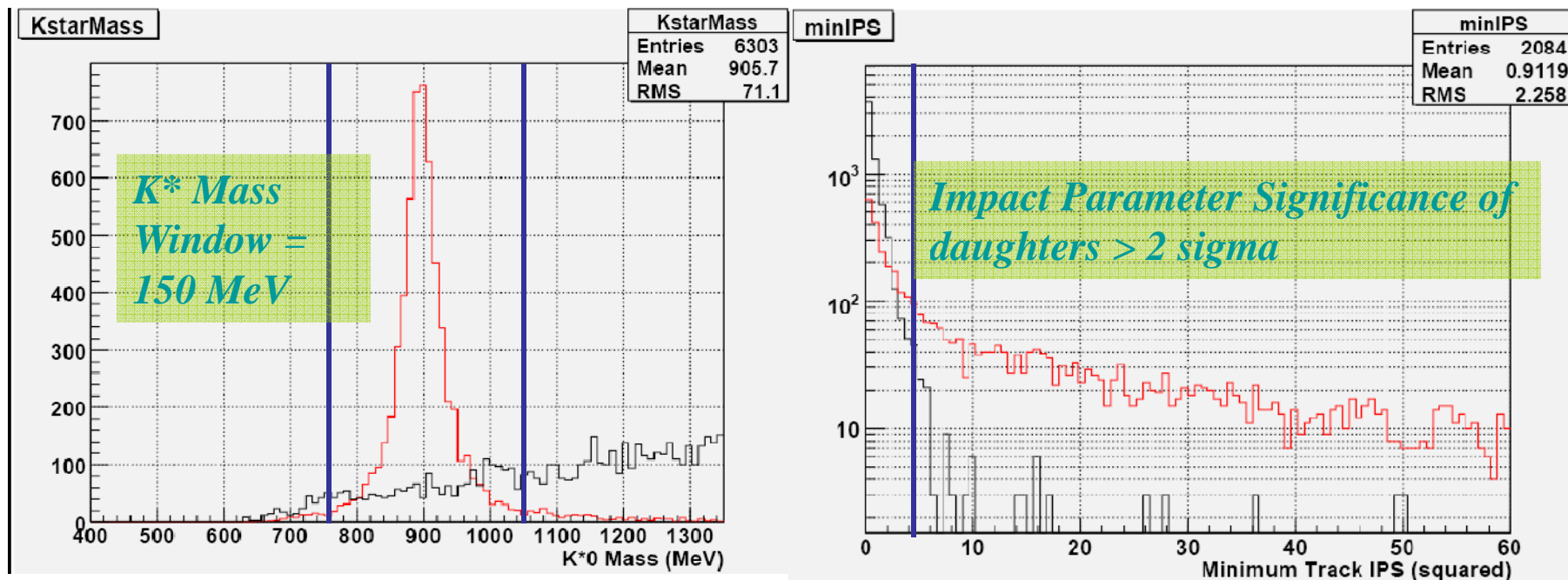
- $B_s(d) \rightarrow K^* K^*$ is planned to be studied on LHCb, see Pablo's talk:
 - <http://indico.cern.ch/getFile.py/access?contribId=1&resId=0&materialId=slides&confId=9591>
- No preselection is currently running for DC06 stripping
- GOAL: propose a DC06 – preselection in order to have something able to run for future stripping.
- The preselection should have a retention $< \text{‰}$
- Efficiencies are referred to reconstructed DC04 signal. ($\sim 10\%$ of generated)
- DC04 preselection (Vincenzo, Stephania...) was 44 % efficient over reconstructed events

Standard Tight K^* (I)

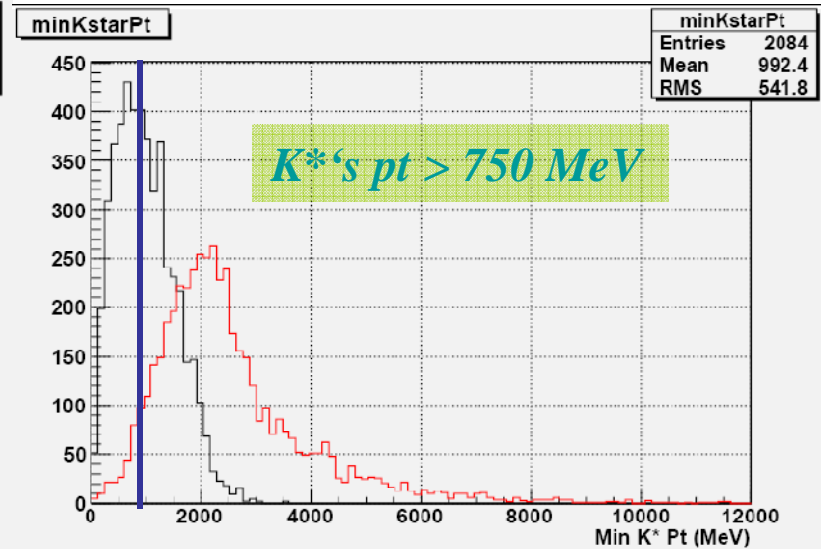
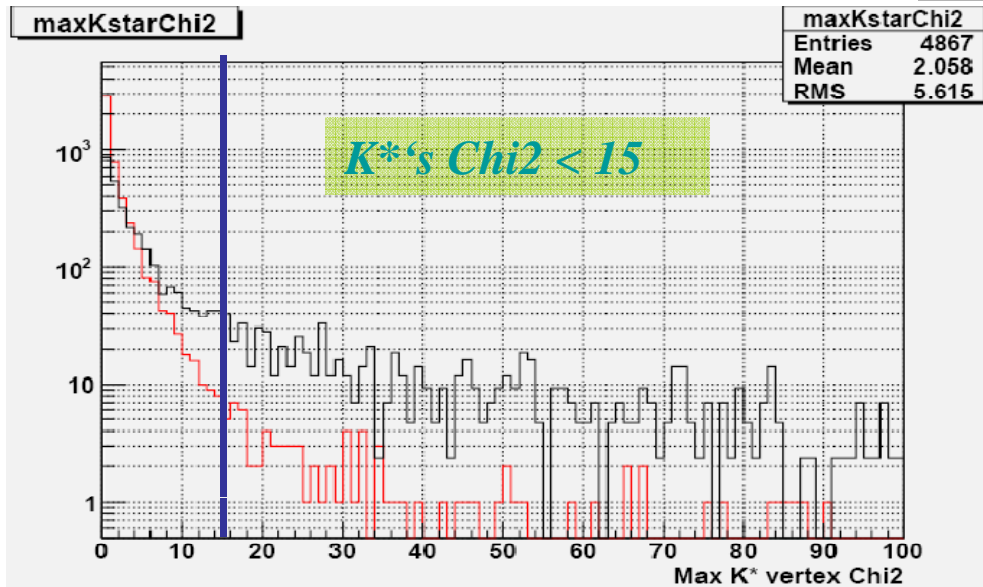
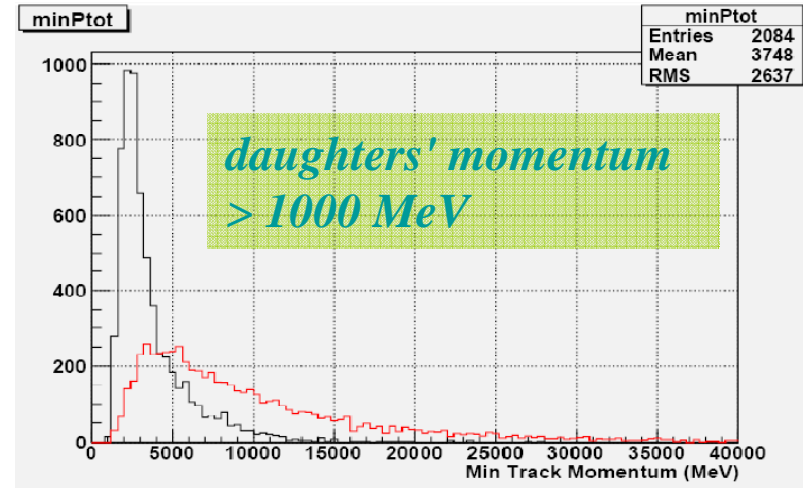
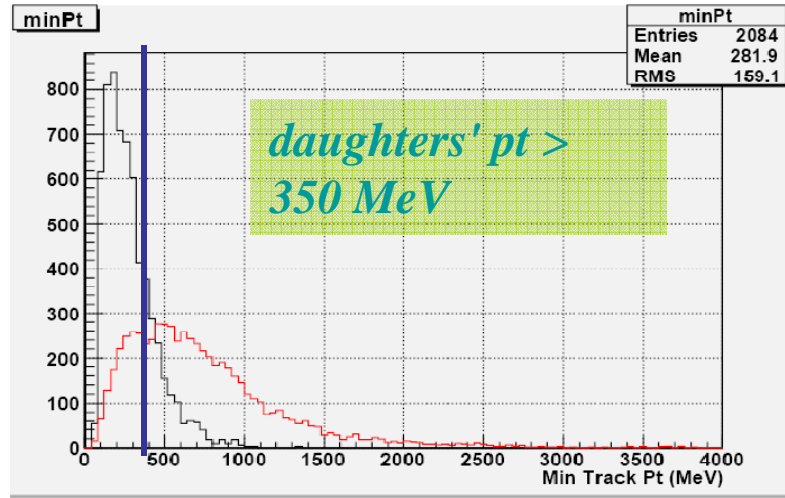
• Sources of Standard K^* :

StdLooseKstar2KPi → Unreasonable retention, hard to reduce it without cutting more on K^* properties

StdTightKstar2KPi → Efficiency goes down to $\sim 50\%$ over reconstructed events, but makes the retention to go close to $\%_0$



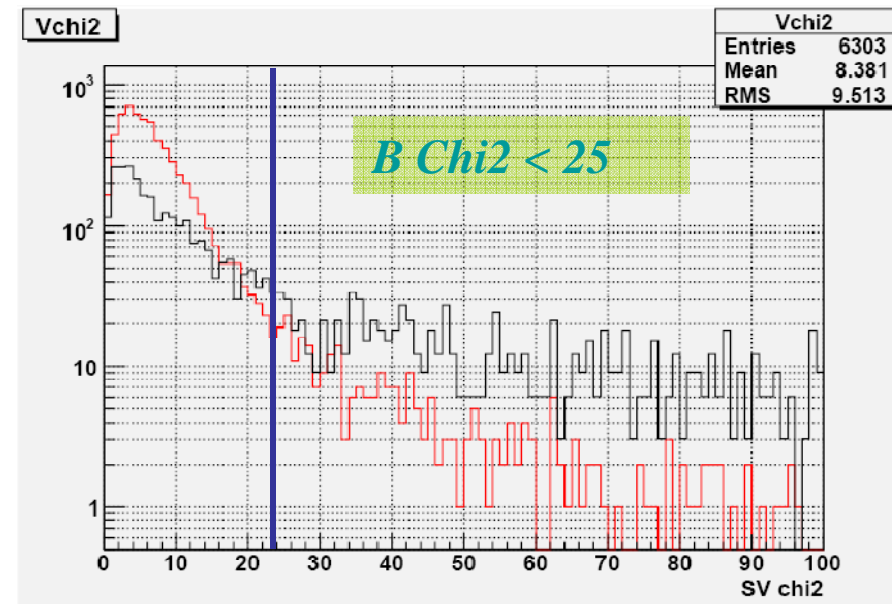
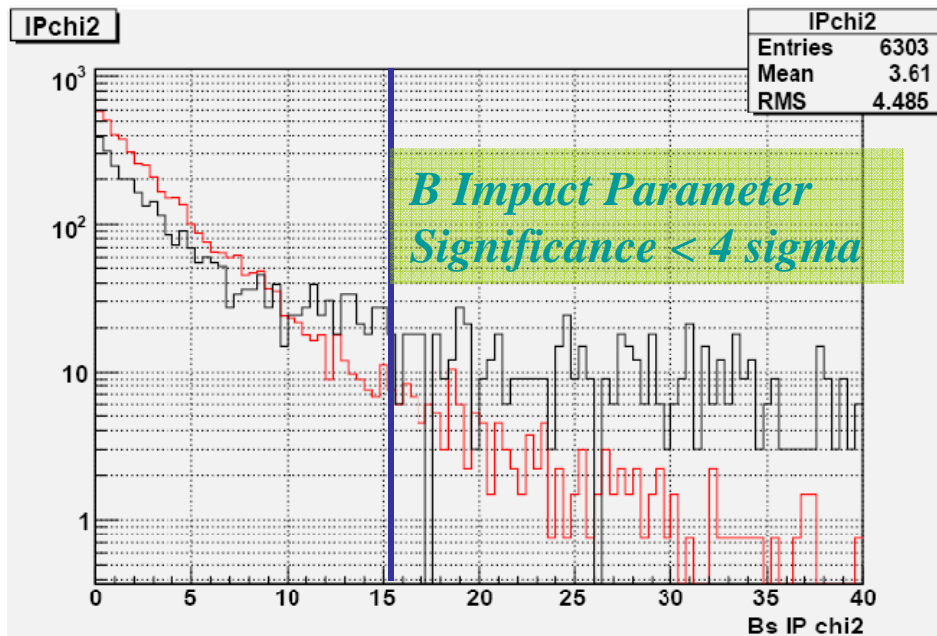
Standard Tight K^* (II)



Preselection Efficiency (I)

- 2 StandarTightKstars \rightarrow 49.9 %
- IPS of Bs $< 4 \rightarrow$ 95.3 %
- χ^2 of Bs $< 25 \rightarrow$ 96.8 %
- Bs Mass Window = 500 MeV \rightarrow \sim 100 %

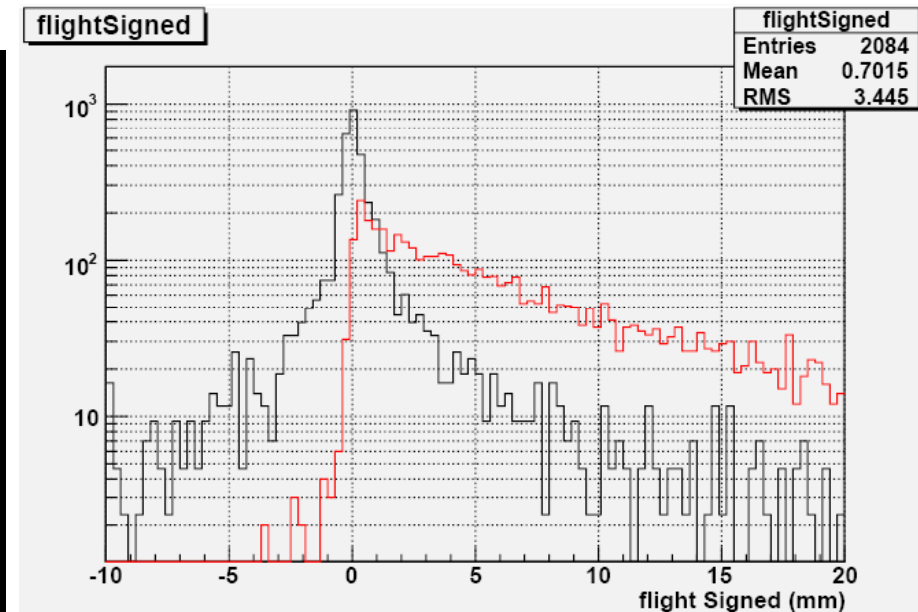
- Tracks Momentum > 1000 MeV: 100 %
- Tracks pt > 350 : 79.7 %
- Tracks IPS > 2 : 72.7 %
- K* Mass Window = 150 MeV : 88.3 %
- K* pt > 750 MeV: 99.8 %
- K* $\chi^2 < 15$: 97.7 %



Preselection Efficiency (II) Distance of flight

Distance of flight (signed) could be used to tune the efficiency – retention point:

<i>Cut (mm)</i>	<i>Efficiency</i>	<i>Retention</i>
None	45.9 %	8/5000 (1.6 ‰)
0.5	45.8 %	5/5000 (1.0 ‰)
1	44.9 %	1/5000 (0.2 ‰)
1.5	43.4 %	2/14890 (0.13 ‰)



DC06: Run over small (4000) sample. Got Eff = 40 ± 2 % over reconstructed events

Background: DC06 – v1 – lumi2 bb inclusive

Conclusions



- A candidate for DC06 $B_s(d) \rightarrow K^* K^*$ preselection was proposed, in order to have one able to run for future stripping
- With an efficiency of 43-44 % over reconstructed DC04 signal decays, reaches a retention of $\sim 0.2 - 0.1$ per mil on DC06 bb inclusive events.
- Options file can be found on </afs/cern.ch/user/d/diegoms/public/DVPreselBs2Kst0Kst0.opts>
- Efficiency is kept on DC06