Event selection for online filter
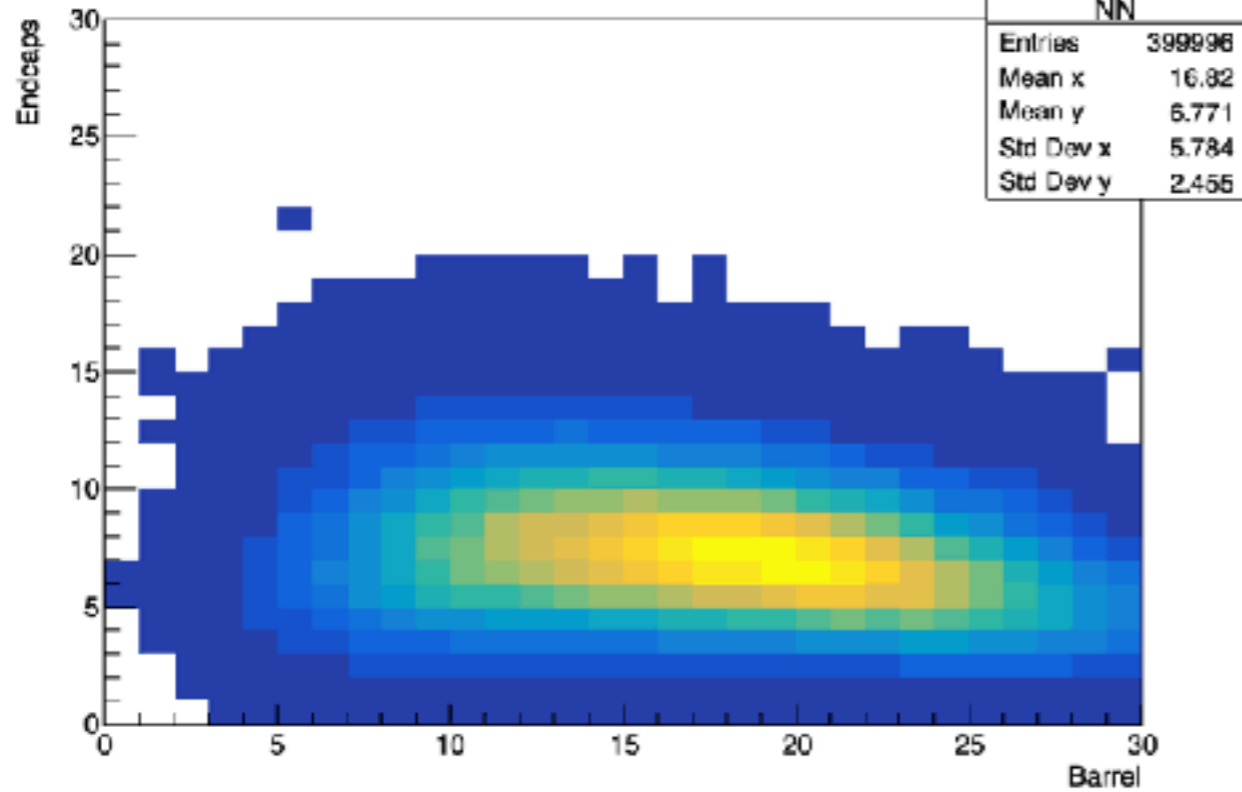
A. Guskov

Event selection

- At least 2 track with p>0.2 GeV/c in the acceptance of the detector.

- Event topology

- At least 1 particle with p_T>0.8 GeV/c (hardness)
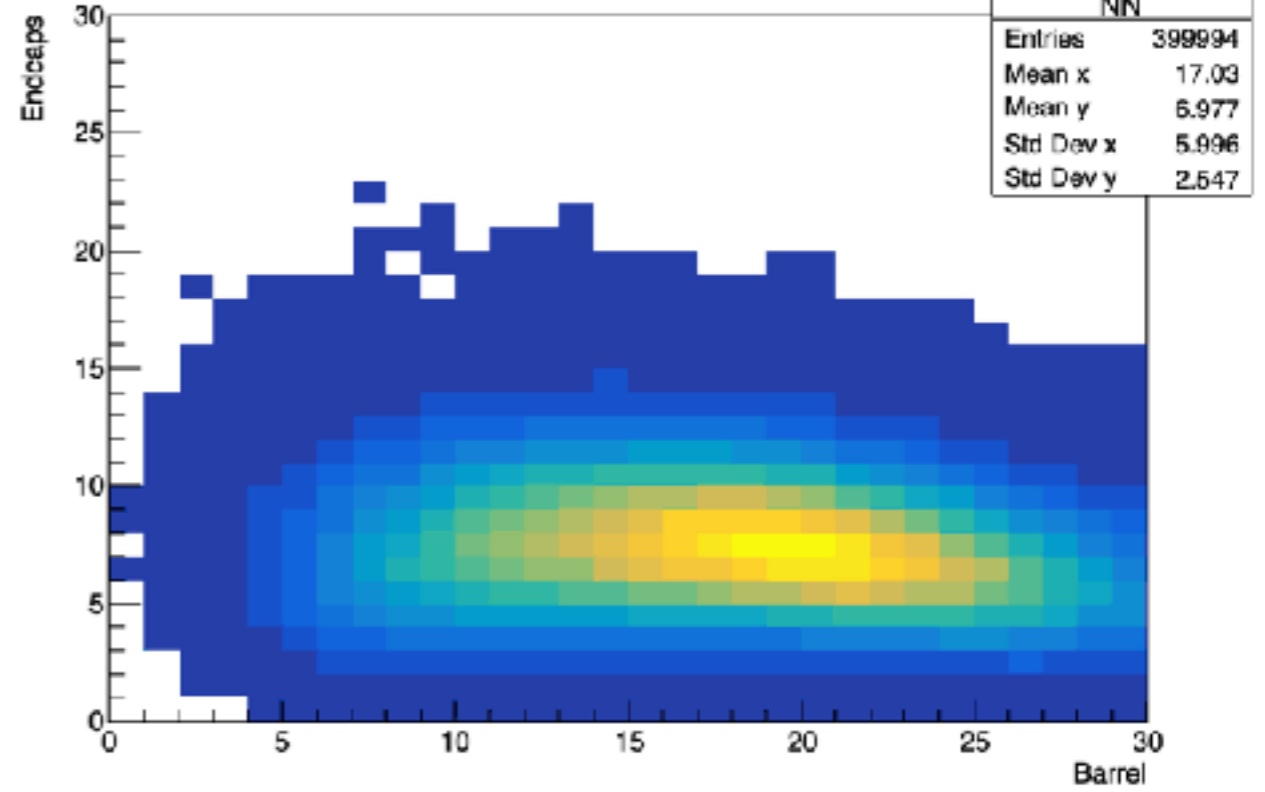
- D0 and J/psi mass

Event topology

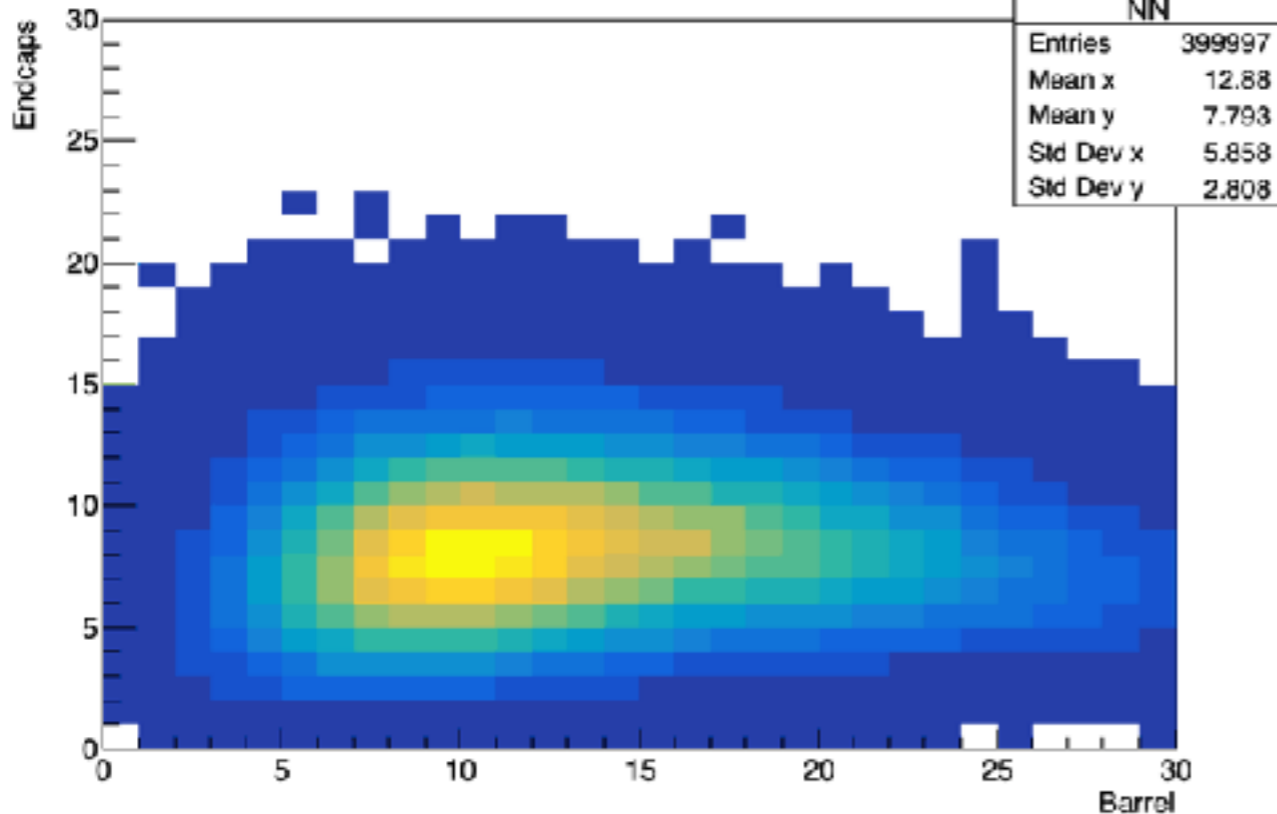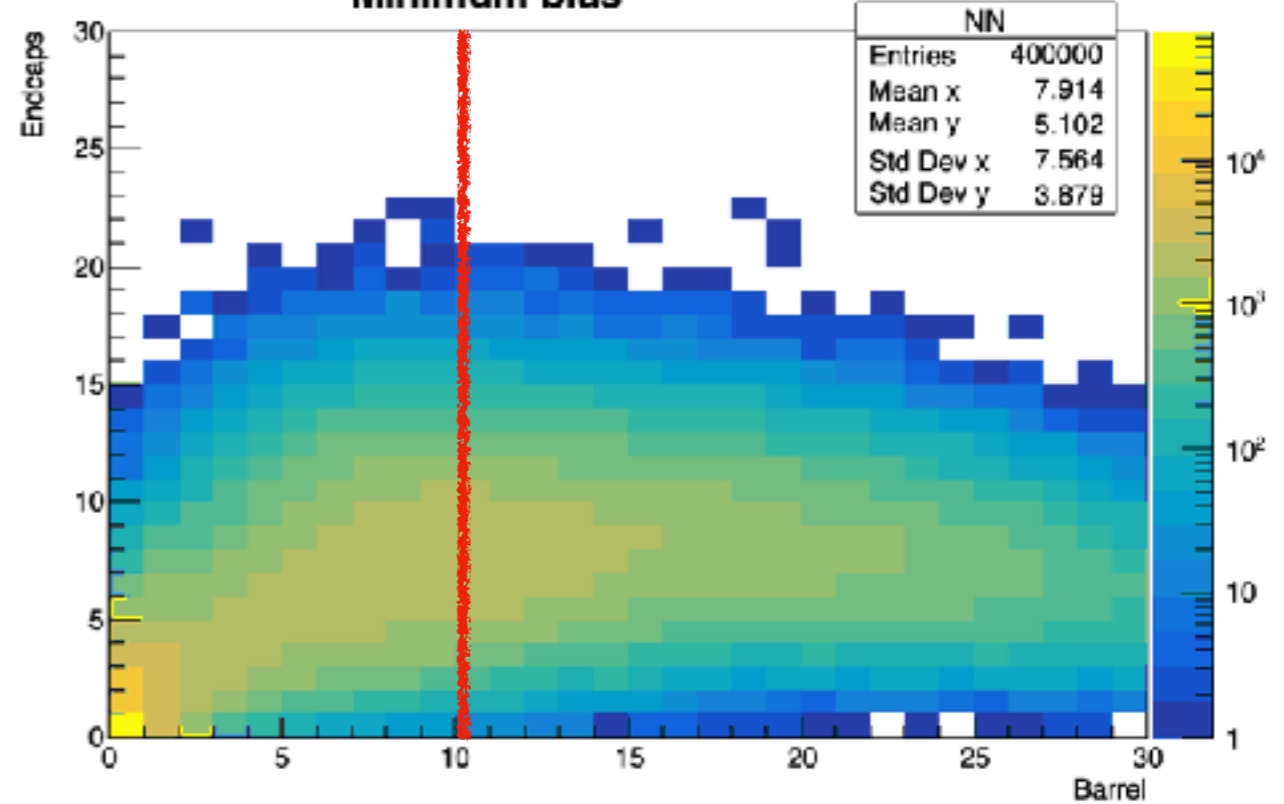**Barrel : θ>0.4 otherwise endcap**

≥10 particles in barrel

Mass

For D0:

1) Mass of any pair of positive and negative tracks for $x_{F\ pair} > 0.45$ is calculated under both πK and Kπ assumptions is calculated

2) It should be within +/- 0.15 GeV with respect to the nominal D0 mass

For J/psi:

1) Mass of any pair of positive and negative tracks with p>0.8 GeV/c is calculated.

2) It should be within +/- 0.2 GeV with respect to the nominal J/psi mass

Data flow

	Rate, kHz	SF	Rate, kHz	SF	Rate, kHz	SF	SF	SF
	Min bias		Diffraction		Non-difractive		D0	J/ψ
Collisions	4000		900		2380			
At least 2 tracks with p>0.2 GeV/c	2910	1.37	513	1.75	2380	1	1	1
Event topology	1520	1.91	19	27	1490	1.59	1.14	1.13
At least 1 track or γ with p_T>0.8 GeV/c	1163	1.31	8	2.28	1146	1.3	1.04	1.01
D0 or J/ψ mass	**402**	2.01	1	8.4	399	2.88	2.3	1.04
		10.0		35000		6.0	2.67	1.18

Efficiencies
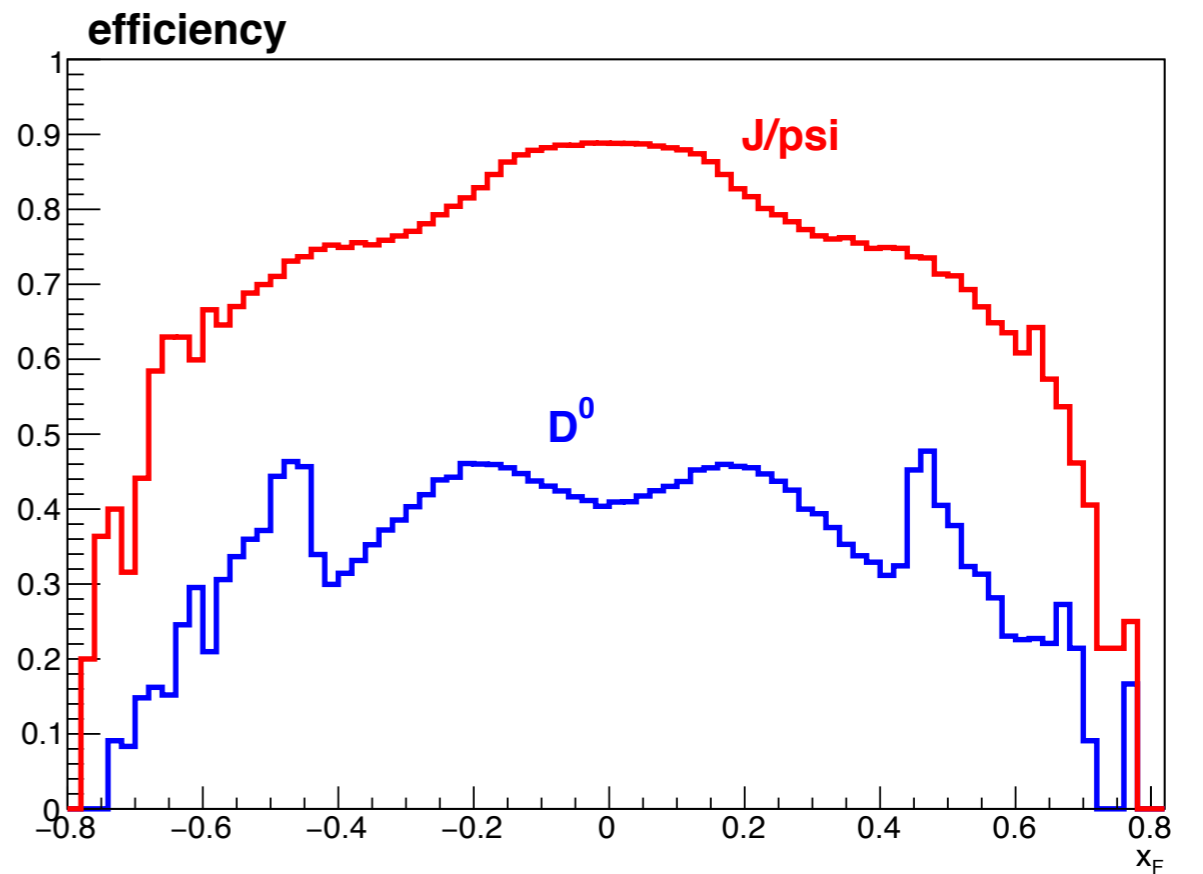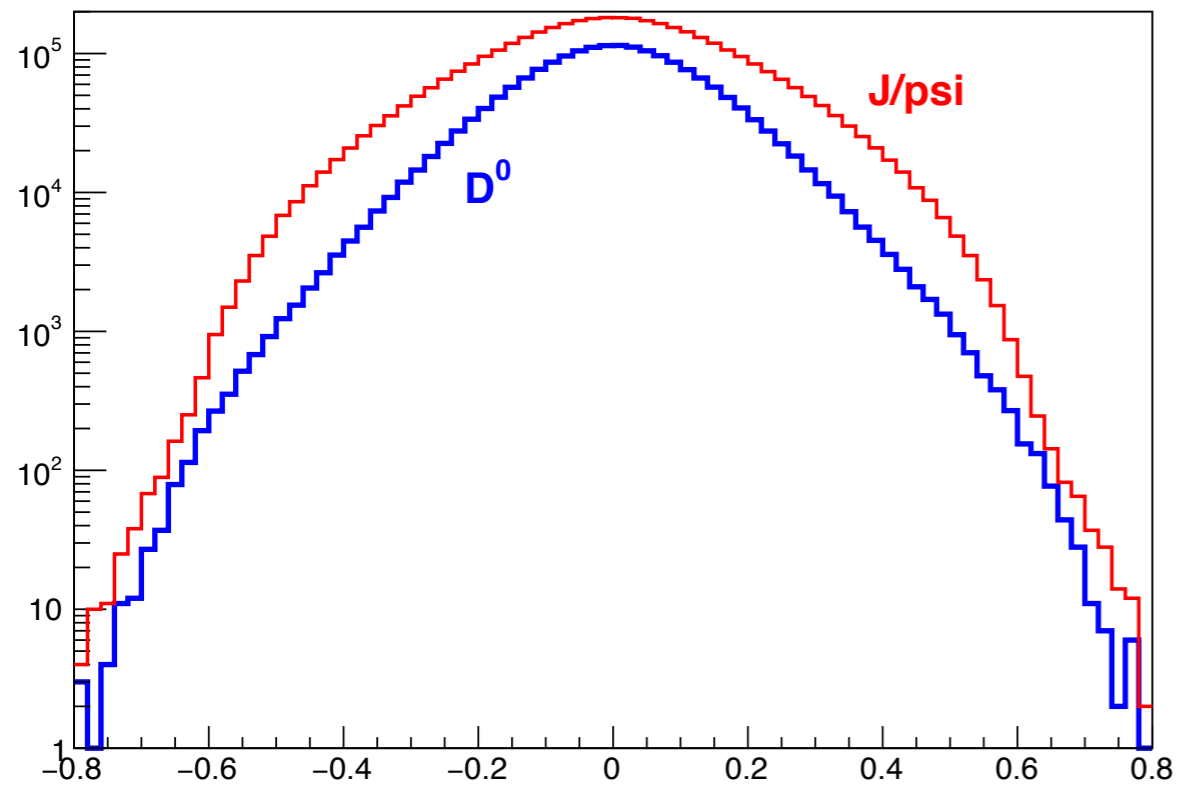
Prompt photons

any cluster with $p_T > 2$ GeV/c

0.3 kHz

Summary

- Basic cuts based on the event topology can reduce the event rate to one order of magnitude (to 400 kHz).

- Mass cuts have low specificity.

- There are possibility for optimization. But not too much, about the factor of 2.