Event mixing

$$\chi_c \to J/\psi\,\gamma \to \mu^+\mu^-\gamma$$

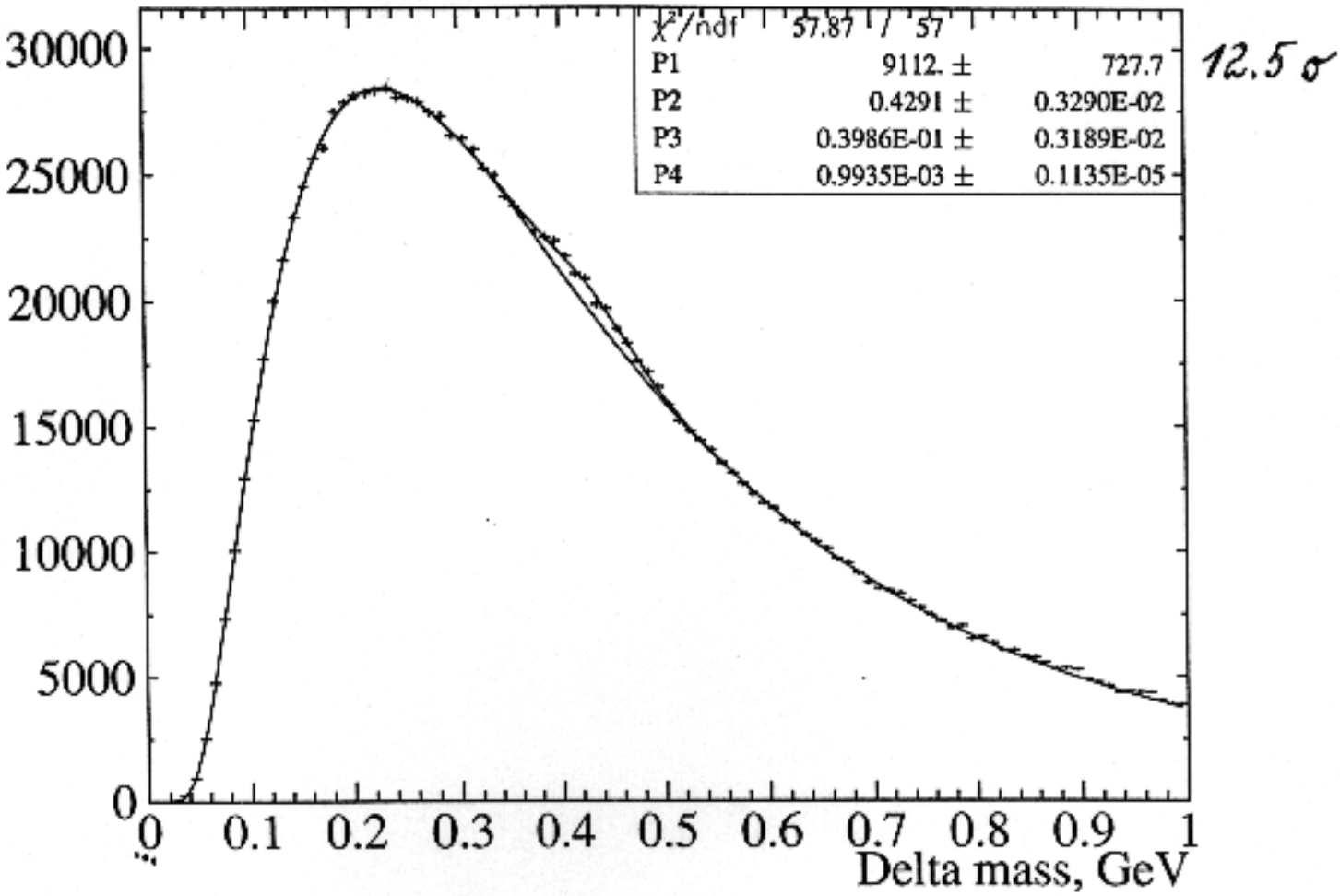
Method: selecting only the most energetic photons in event

	fit region	χ^2/ndf	# χ_c	M_{χ_c} (MeV)	σ_{χ_c} (MeV)
Event mixing without any requirements on similarity of mixing events	0. : 1.	409/95	9062 ± 731	426 ± 3	39.6 ± 3.2
Event mixing in slices of J/ψ energy	– 11 –	306/95	7900 ± 665	432 ± 3	37.2 ± 3.0
Event mixing in slices of total energy in ECAL	– 11 –	208/95	9381 ± 753	429 ± 3	40.8 ± 3.3
Event mixing in slices of # photons with E > 5 GeV (Olya)	– 11 –	151/95	8136 ± 682	430 ± 3	37.3 ± 3.0
Event mixing without any requirements on similarity of mixing events	0.15:0.75	68/57	8837 ± 600	426 ± 3	39.9 ± 0.0 fixed
Event mixing in slices of J/ψ energy	– 11 –	85/57	8759 ± 611	431 ± 3	– 11 –
	0.1 : 0.7	68/56	9100 ± 592	431 ± 3	– 11 –
Event mixing in slices of total energy in ECAL	0.15 : 0.75	61/57	9306 ± 599	429 ± 3	– 11 –
Event mixing in slices of # photons with E > 5 GeV (Olya)	– 11 –	58/57	9112 ± 728	429 ± 3	39.9 ± 3.2

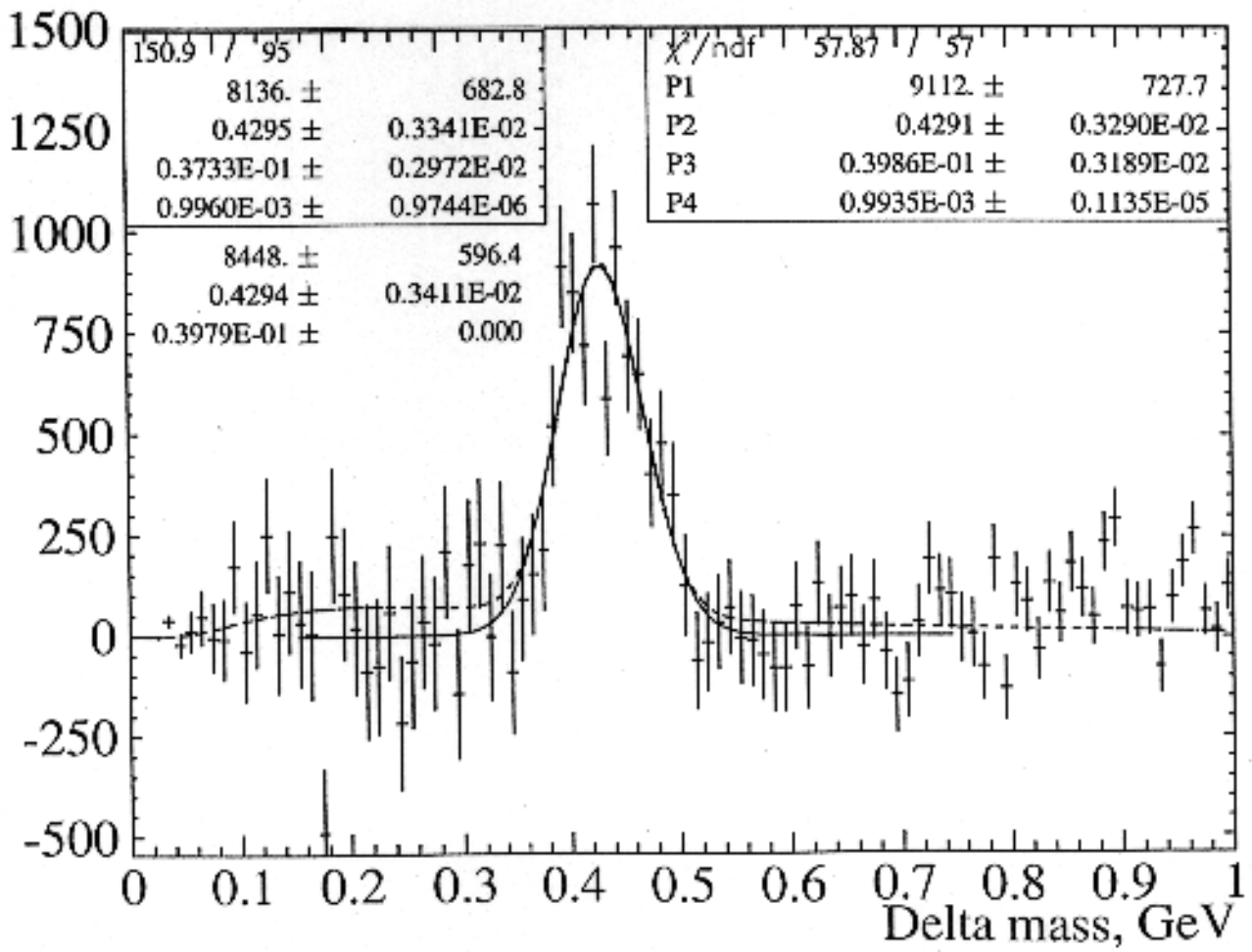
Conclusion

1. Using slices in number of photons with energy greater than 5 GeV gives the best results in describing the beginning and the end of the spectrum.
2. Fitting in the interval 0.15 : 0.75 gives acceptable χ^2 in all cases with similar # of χ_c Remaining differences can be included in the systematic error.

8 most energetic gammas in ev



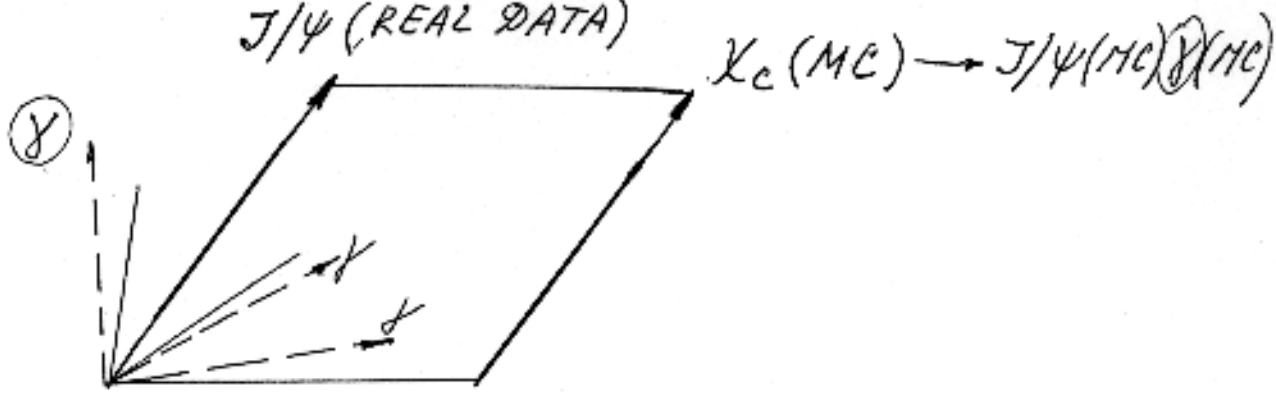
12.5 σ



	A. Lanyov's cuts	Selection 8 energetic photons in event
$\#\chi_c$	6806 ± 1058	9112 ± 728

Next step:
Photon reconstruction efficiency

Efficiency depends on the rest of the event, which is not reproduced in MC.
One can obtain it from REAL DATA substituting the real J/ψ in event by MC generated χ_c ($\vec{P}_{\chi_c} = \vec{P}_{J/\psi}$).
Using the fact that
J/ψ and χ_c momentum distributions are similar.
Thus the rest of event is taken from REAL DATA.
By applying the same cuts the efficiency of MC generated photon can be determined.



(γ) can be from real χ_c