Status report on experiment WA102

A search for centrally produced non−$q\bar{q}$ mesons

Annecy LAPP – Athens – Bergen – Birmingham – CERN
Dubna JINR – IISN Belgium – Los Alomos LANL
Manchester – Oslo – Protvino IHEP – Tsukuba KEK

Outline

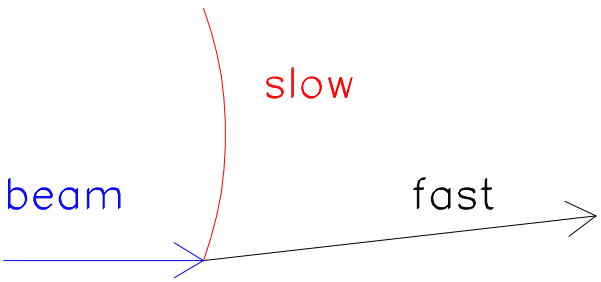
1) An introduction to experiment WA102

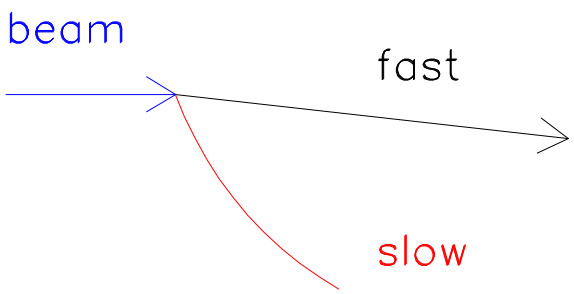
2) Data taking status

3) Preliminary results

4) The request for 1996

Trigger types used in the 1994 WA91 experiment



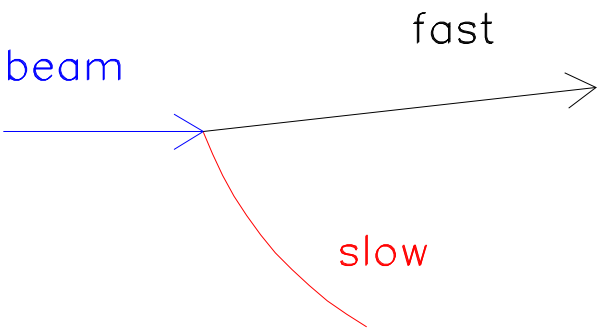


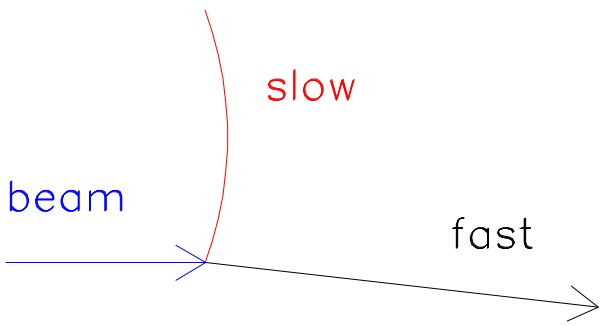
$L_{slow} L_{fast}$

$R_{slow} R_{fast}$

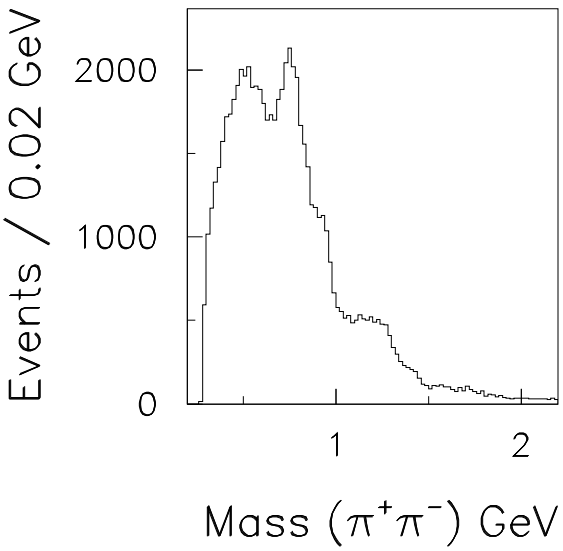
$R_{slow} L_{fast}$

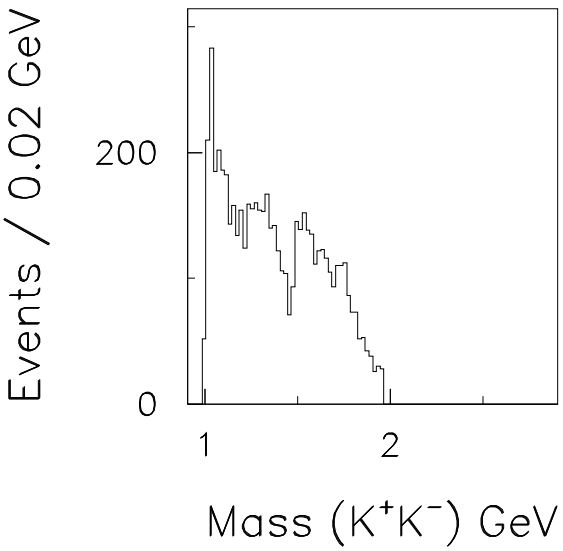
$L_{slow} R_{fast}$



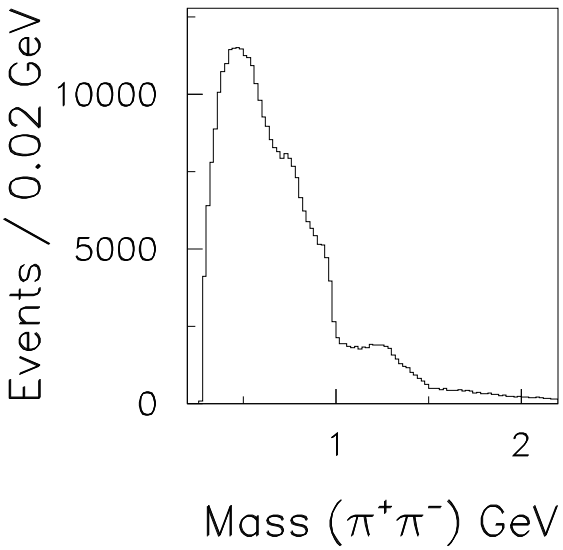


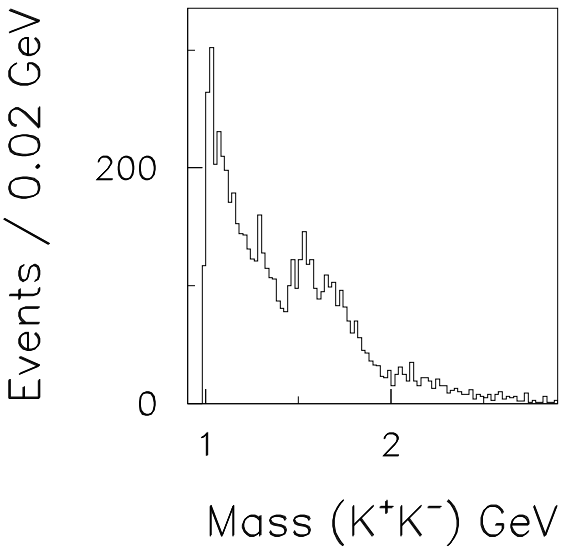
Mass spectra as a function of energy



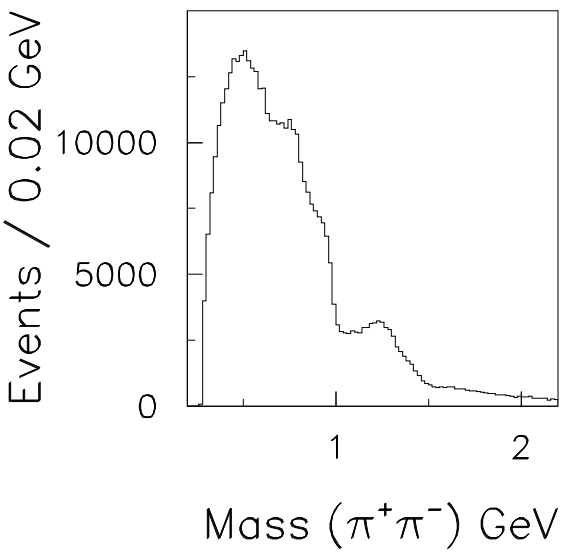


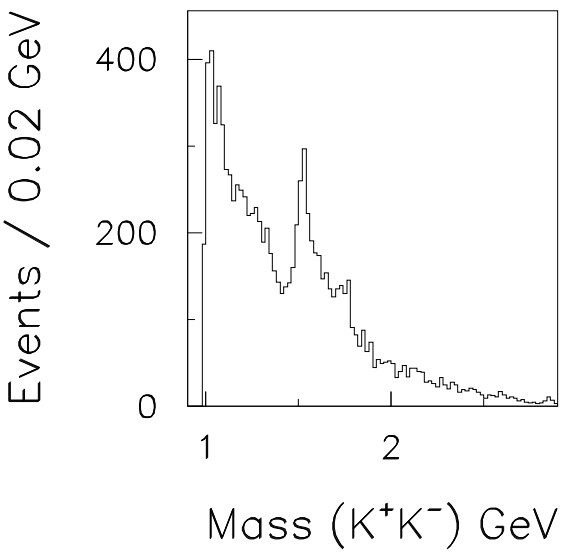
WA76
$\sqrt{S}$ = 12.7 GeV





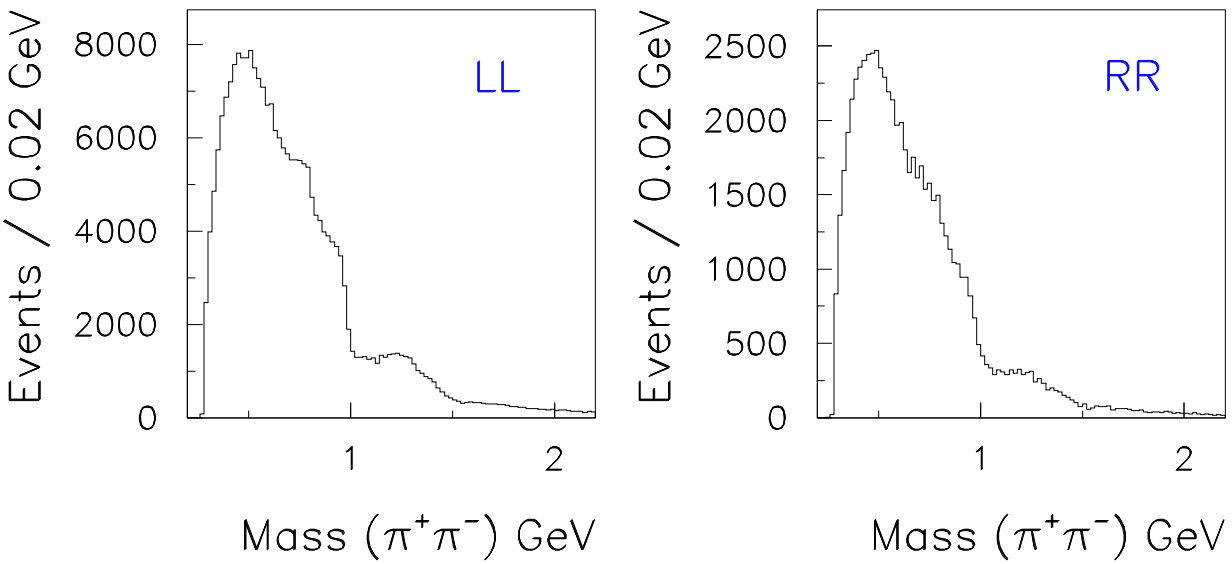
WA76'
$\sqrt{S}$ = 23.8 GeV

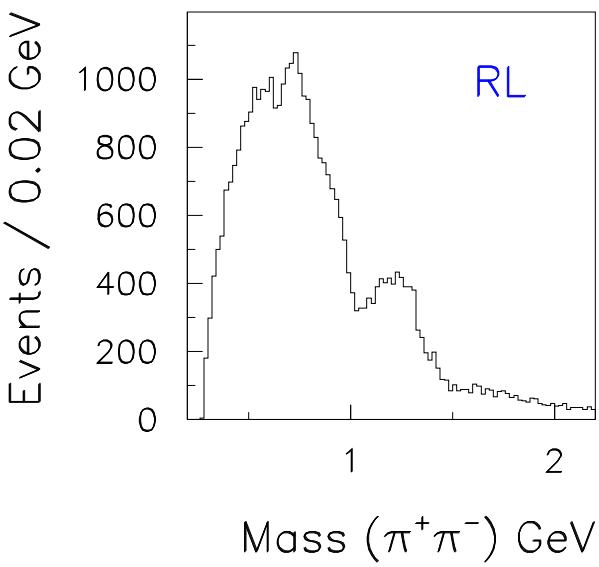


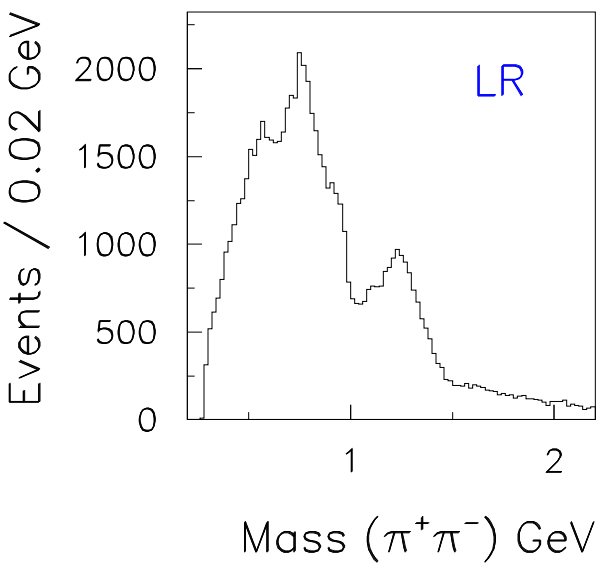


WA91
$\sqrt{S}$ = 29 GeV

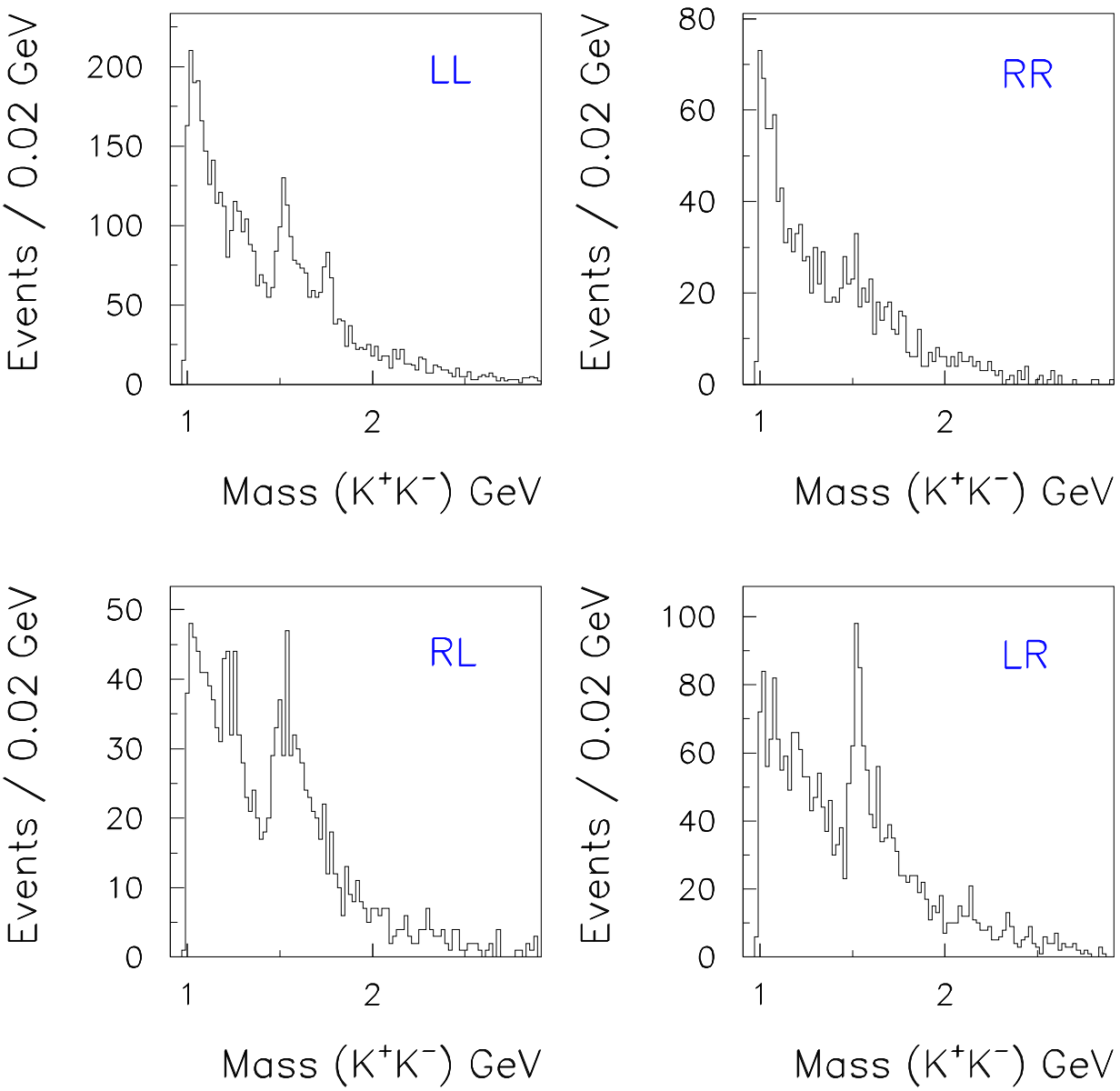
As a function of trigger type



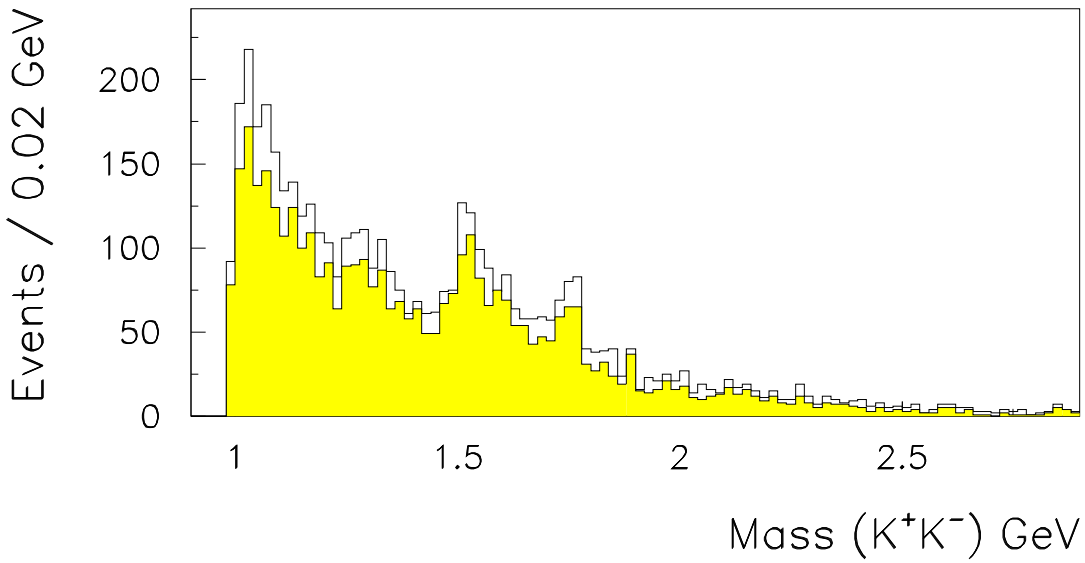


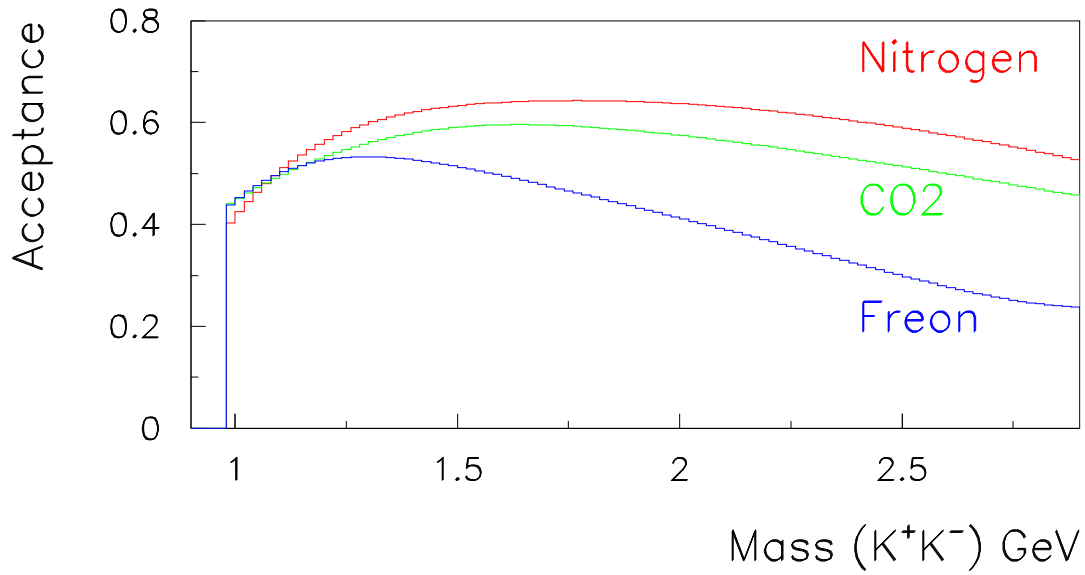


As a function of trigger type



Acceptance for One cerenkov setup





In a 100 day run it would give a 5 fold increase in K^+K^- statistics

The γ acceptance, taking into account the extra material and reduced geometrical acceptance is 90 % per photon of the 1995 setup

Hence we would still accept 60 % of the $\eta\eta$ events

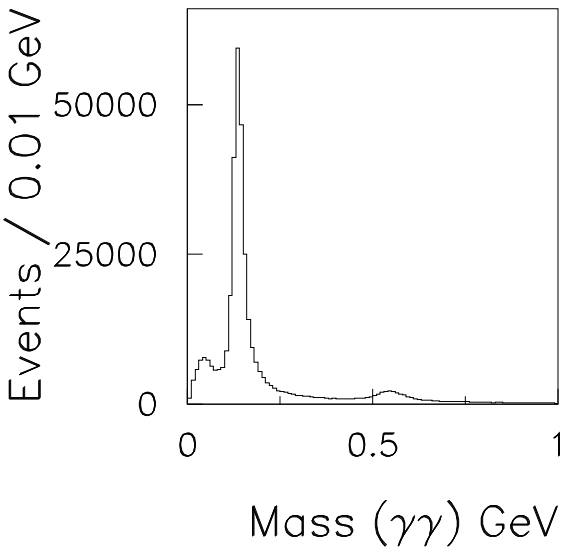
The status of the 1995 WA102 data

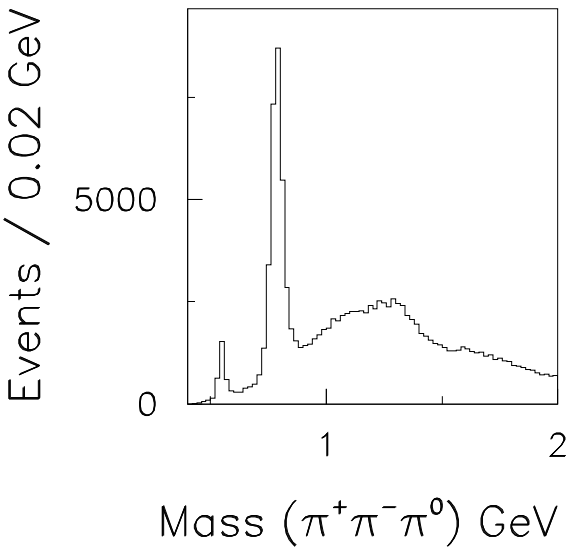
200 Million events were recorded from the 90 days of beam time in 1995

40 % of the data has been passed through a preliminary version of the reconstruction program using preliminary calibration coefficients for the calorimeters

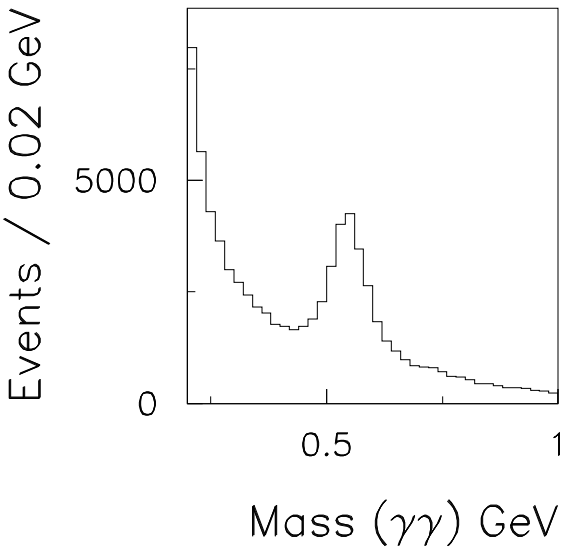
A preliminary analysis of this data has been performed

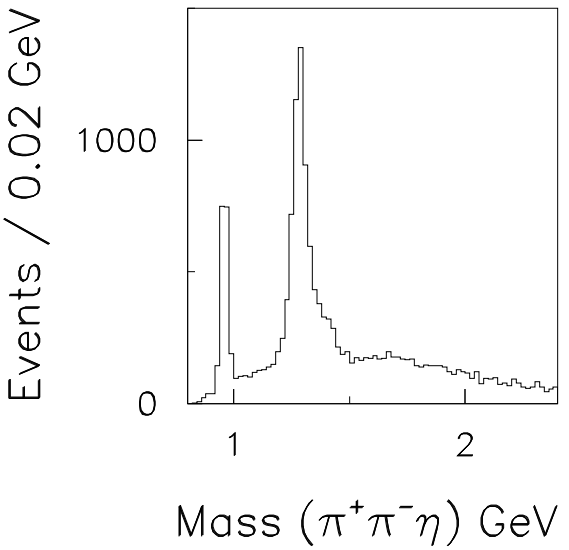
$pp \rightarrow pp(\pi^+\pi^- n\gamma)$



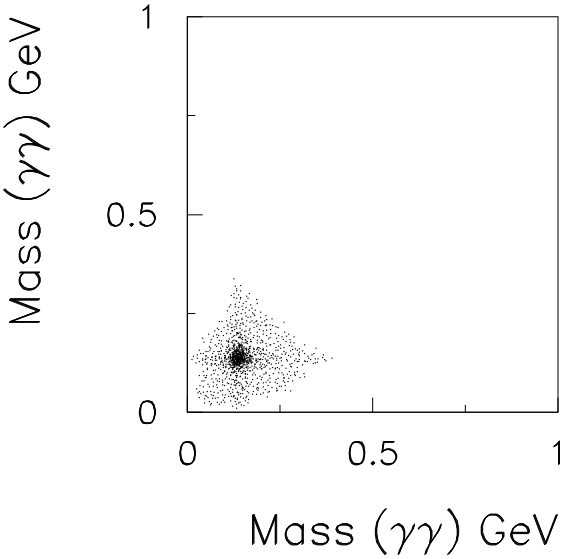


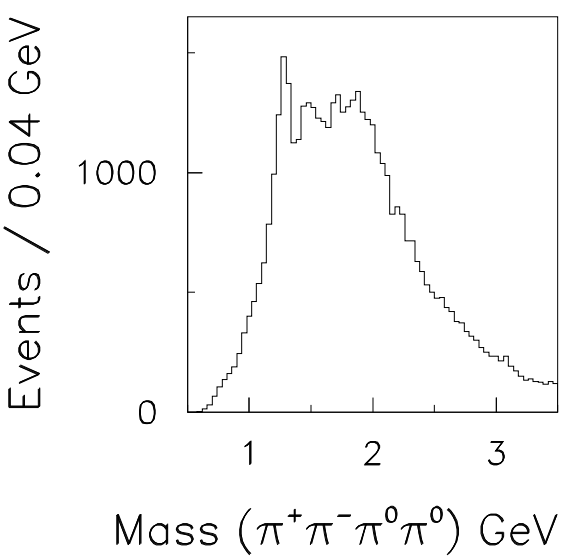
n = 2





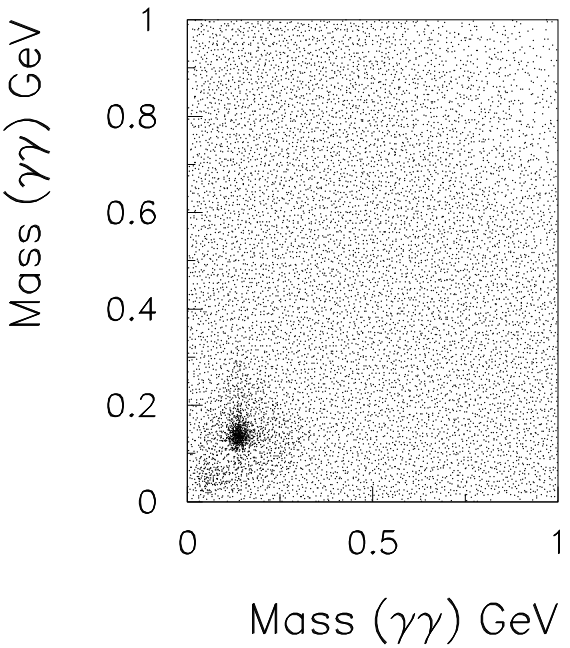
n = 2

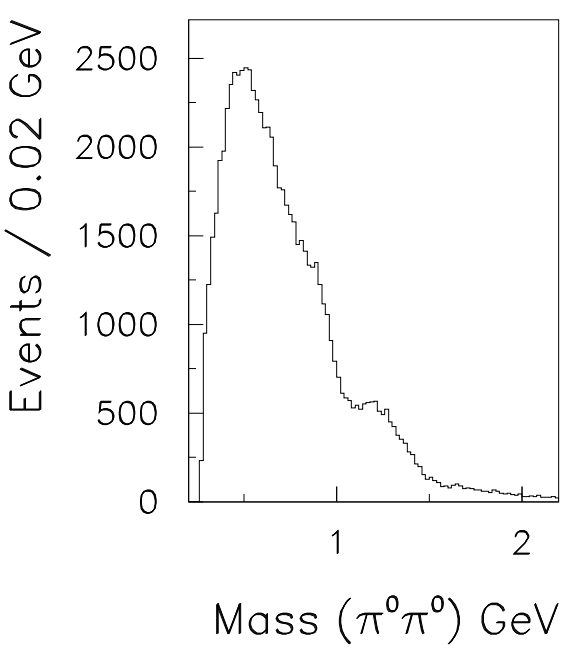


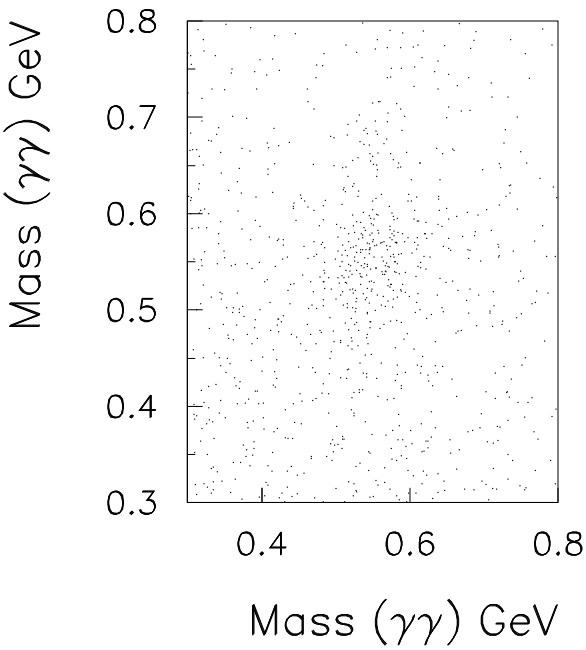


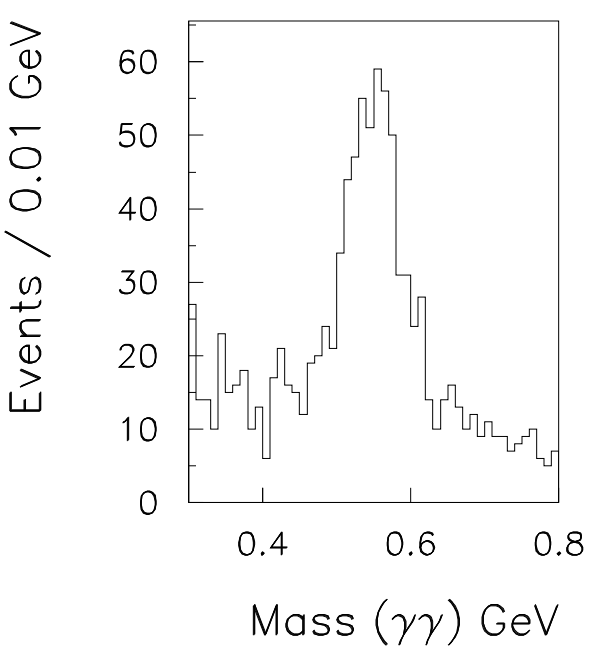
n = 4

$pp \rightarrow pp(4\gamma)$

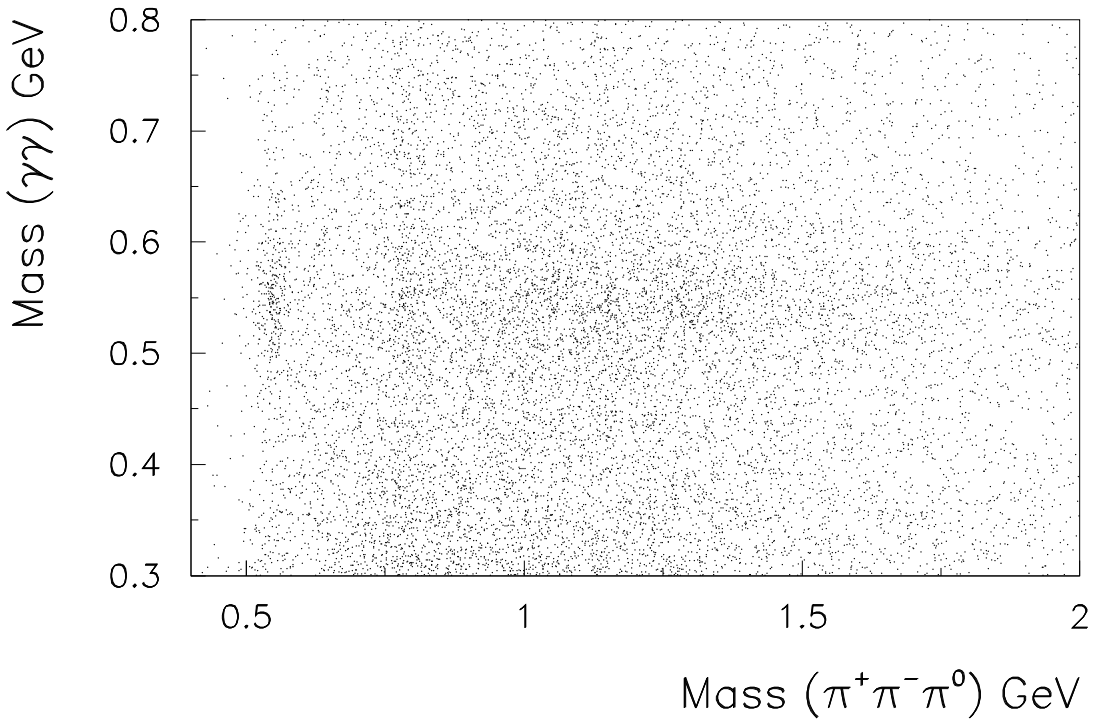




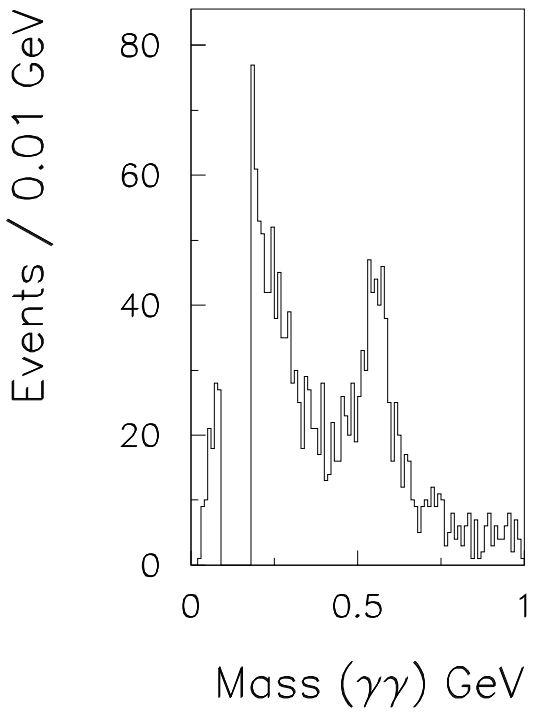




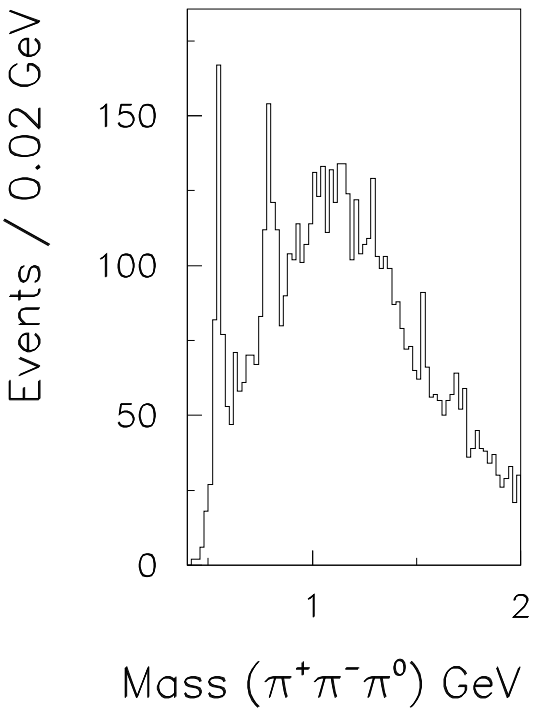
$pp \rightarrow pp(\pi^+\pi^-\pi^0\gamma\gamma)$



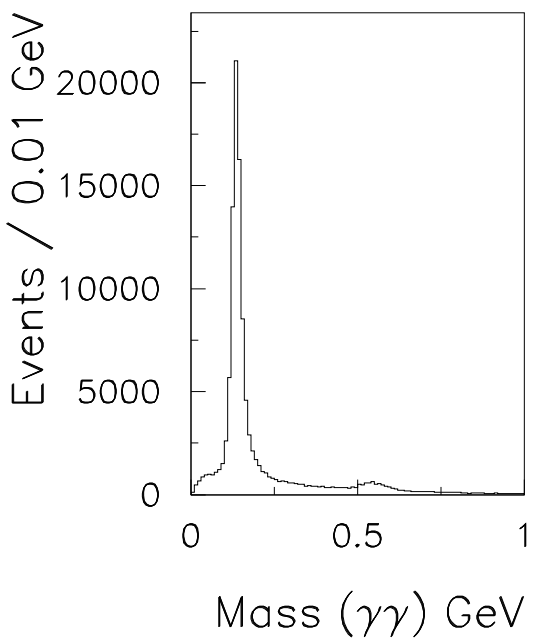
if $\eta \rightarrow \pi^+\pi^-\pi^0$

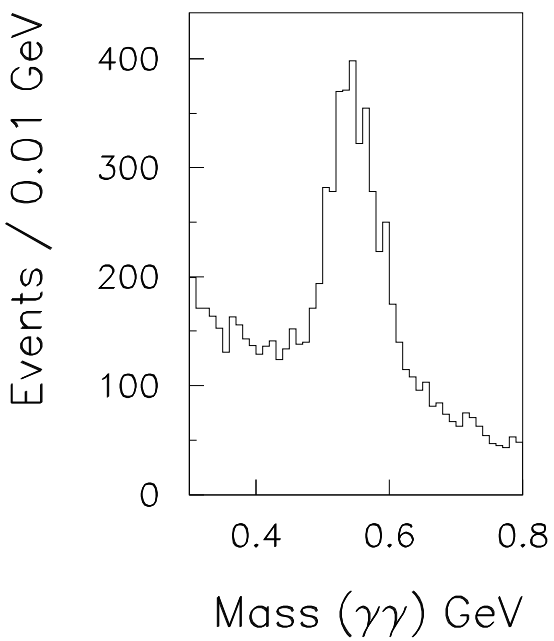


if $\eta \rightarrow \gamma\gamma$



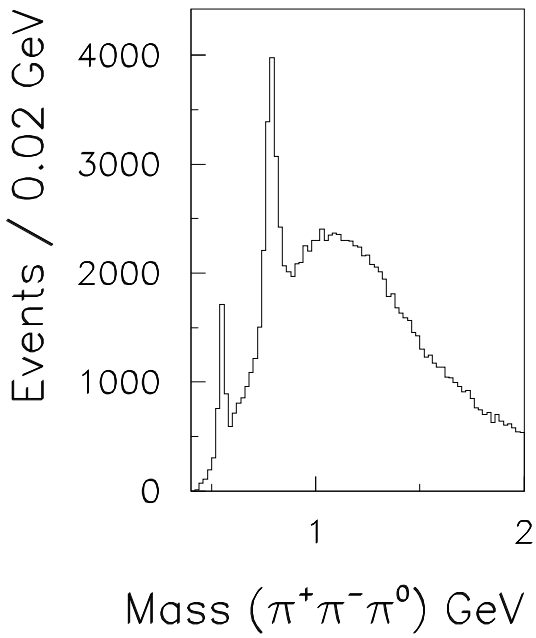
$pp \rightarrow pp(\pi^+\pi^-\pi^+\pi^- 2\gamma)$



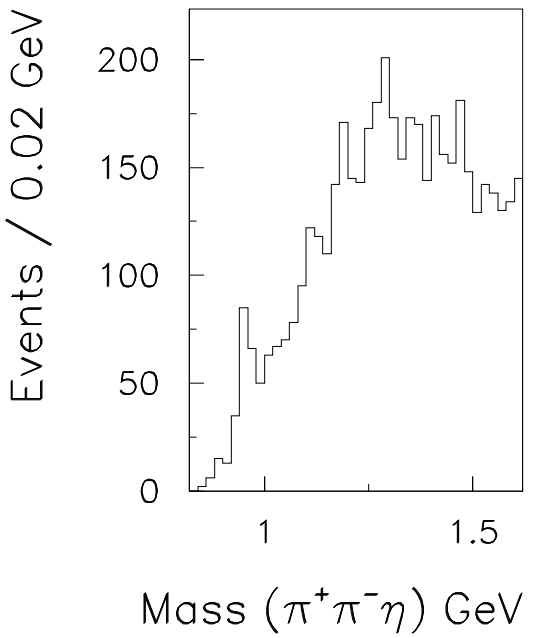


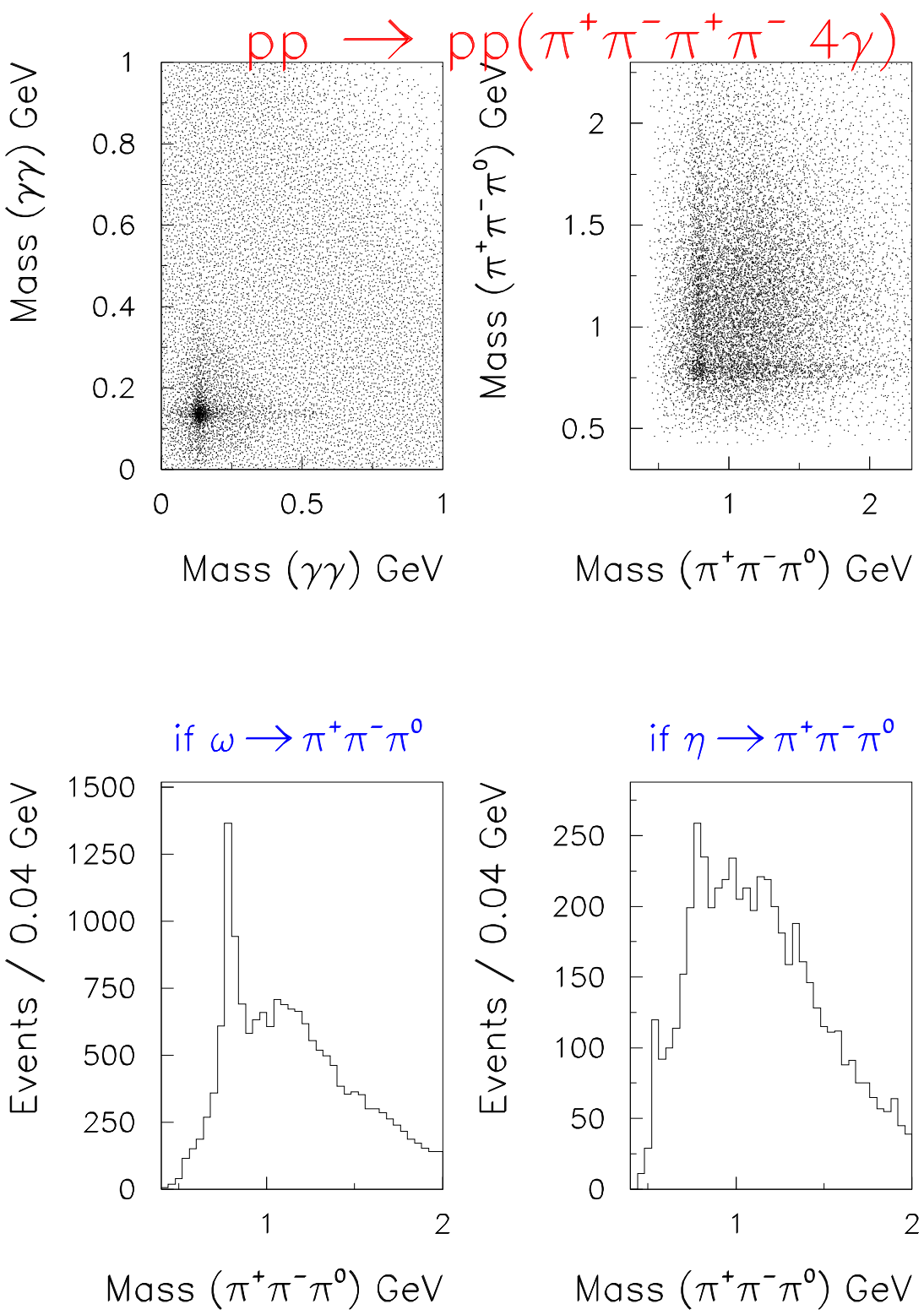
Evidence of

$\eta\pi^+\pi^-$ and $\omega\pi^+\pi^-$



$\eta'\pi^+\pi^-$




pp → pp(π⁺π⁻π⁺π⁻ 4γ)
Mass (γγ) GeV
Mass (γγ) GeV
Mass (π⁺π⁻π⁰) GeV
Mass (π⁺π⁻π⁰) GeV
if ω → π⁺π⁻π⁰
if η → π⁺π⁻π⁰
Events / 0.04 GeV
Events / 0.04 GeV
Mass (π⁺π⁻π⁰) GeV
Mass (π⁺π⁻π⁰) GeV

To be done next

Perform the reconstruction of the 1995 data using
the improved reconstruction package and new calibration
coefficients

Begin December 1995 – End April 1996

1996 Run

We still need more statistics from final states with γs

But we also need more statistics on the K^+K^- final state
in order to answer the question on the spin of
the $\vartheta/f_2(1720)$

and if we confirm the $f_2(2175)$ observed in
the $\eta\eta$ final state by NA12/2 it will be
essential to determine its branching ratio into K^+K^-

Summary and request for 1996

The preliminary results from the 1995 run are encouraging

We would like to make the most of the final year at Omega

We therefore request at least 100 days of proton beam
in 1996 beginning in April

using the single cerenkov plus GAMS setup

which will give a factor of 5 increase in K^+K^- statistics
while still allowing us to study final states including γs