

CB NOTE XXX+1

# Muons in four prong data.

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In 8000 events fitted as  $2\pi^+2\pi^-\eta$  (with a soft CL greater than 0.1 %) we find 107 events with one track with  $dE/dx$  less than 0.006 in the region where we can distinguish muons from pions by  $dE/dx$  ( $p \leq 100MeV$ ). See Fig.1 . With CL cut greater than 10 % we keep almost half (47 events) of all these events.

No muons (0 events) are expected from the decay of the  $\pi$  from Monte Carlo phase space simulation. However, the analyses of 200 000 Monte Carlo events simulated as

$$\bar{p}p \rightarrow E\pi^+\pi^-, \quad (1)$$

where  $E \rightarrow \eta\pi^+\pi^-$

with  $\eta \rightarrow 2\gamma$ .

and of 200 000 Monte Carlo events simulated as

$$\bar{p}p \rightarrow \eta'\pi^+\pi^-, \quad (2)$$

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

with  $\eta \rightarrow 2\gamma$ ,

where the charge pions are softer than for phase space events, explains quantitatively this effect. Statistically this effect is not very strong. We loose up to 5 % of the E - signal and less than 3 % of the  $\eta'$  - signal , well within the statistical errors given for these reactions (See CB-Notes 318). However, these events create spurious narrow peaks in the  $\eta\pi^+\pi^-$  and  $\eta\pi$  invariant mass distributions "low mass"  $\eta'$  and  $a_0$  signals. (See Fig.2) Among the 107 "  $\mu$  - candidates " , only two events are pair (+-) of "light" charged particles. Both of them are identified as Dalitz pairs. We also find that the 105 events with one muon candidate have a "missing momentum" which is larger than the "missing momentum" for normal  $2\pi^+2\pi^-\eta$  events. This comforts the interpretation of the 105 events as due to pion decay into muon and neutrino.

## References

- [1] N.Djaoshvili et al., CB-Note-321