

<i>rejection (n)</i>	p21	p22	p2all
<i>Loose Setup</i>	10233.5 $\pm$ 7235.8 (2)	2512.0 $\pm$ 2511.5 (1)	7659.7 $\pm$ 4422.0 (3)
<i>TD</i>	6109.5 $\pm$ 4319.7 (2)	1540.0 $\pm$ 1539.5 (1)	6879.5 $\pm$ 4864.2 (2)
<i>TD · KIN</i>	3925.0 $\pm$ 3924.5 (1)	659.0 $\pm$ 658.5 (1)	4584.0 $\pm$ 4583.5 (1)

Table 1: **1-Beam Rejection Summary** of Tables 6-8. Each row is a different branch to measure the DELCO rejection. First number is the rejection. The number in parenthesis is the number of events remaining that the rejection is based upon. The minimum rejection is used in calculation of the 1-BM background for a conservative estimate.

<i>Norm. branches</i>	p21	p22	p2all
<b>ALL cuts below NORM</b>	25.0 $\pm$ 5.0	43.0 $\pm$ 6.6	68.0 $\pm$ 8.2
<i>PV · TD norm</i>	371.0 $\pm$ 19.3	607.0 $\pm$ 24.6	978.0 $\pm$ 31.3
<i>CkTRS · CkTail rej</i>	3.0 $\pm$ 0.1	2.6 $\pm$ 0.1	2.7 $\pm$ 0.1
<i>BADEDX norm</i>	583.0 $\pm$ 24.1	16.0 $\pm$ 4.0	599.0 $\pm$ 24.5
<i>CpiTRS · CpiTail rej</i>	256.0 $\pm$ 255.5	6.0 $\pm$ 3.9	134.0 $\pm$ 94.4
$N_K$	189.3 $\pm$ 11.6	389.1 $\pm$ 18.6	568.6 $\pm$ 21.5
$N_{pi}$	2.3 $\pm$ 2.3	3.2 $\pm$ 2.1	4.5 $\pm$ 3.2

Table 2: **1-Beam Normalization Summary** of Tables 9-13. The ALL-cuts-below row uses the combination of all cuts in the following 4 rows (branches) and is the normalization number used in the calculation of the numbers reported in Table 5 (Total Background). The sum of the last two rows provide a check on the ALL-cuts-below number.

<i>rejection</i> ( <i>n</i> )	p21	p22	p2all
$Rej_{K-K} : BWTRS \cdot CkTRS \cdot CkTail$	$43.8 \pm 12.0$ (13)	$76.2 \pm 18.9$ (16)	$61.7 \pm 11.4$ (29)
$Rej_{K-\pi} : BWTRS \cdot C\pi iTRS \cdot C\pi iTail$	$339.7 \pm 138.5$ (6)	$13.0 \pm 3.2$ (15)	$106.3 \pm 23.1$ (21)

Table 3: **2-Beam Rejection Summary** of Tables 14-15. First number is the rejection. The number in parenthesis is the number of events remaining that the rejection is based upon. K-K is the case where two Kaons are entering the beam. K- $\pi$  is the case where we have a Kaon and a Pion entering.  $\overline{B4TRS \cdot B4CCD}$  is applied.

<i>Norm. branches</i>	p21	p22	p2all
$K-K_n : B4TRS \cdot B4CCD$	$19.0 \pm 4.4$	$49.0 \pm 7.0$	$68.0 \pm 8.2$
$K-K_r : TG \cdot TGKIN \cdot TGPV$	$16.0 \pm 5.9$	$21.8 \pm 6.2$	$19.7 \pm 4.4$
$K-\pi i_n : B4TRS \cdot B4CCD$	$41.0 \pm 6.4$	$29.0 \pm 5.4$	$70.0 \pm 8.4$
$K-\pi i_r : TG \cdot TGKIN \cdot TGPV$	$116.2 \pm 51.7$	$12.1 \pm 4.4$	$55.5 \pm 15.9$
$N_{K-K}$	$1.2 \pm 0.5$	$2.2 \pm 0.7$	$3.5 \pm 0.9$
$N_{K-\pi}$	$0.4 \pm 0.2$	$2.4 \pm 1.0$	$1.3 \pm 0.4$

Table 4: **2-Beam Normalization Summary** of Tables 16-19. The 2-BM Normalization has 2 branches that are further bifurcated.  $K-K_{r,n}$ ,  $K-\pi i_{r,n}$  are the results of the bifurcations, r=rejection, n=normalization, which we used to determine the last two rows.  $N_{K-K}$  and  $N_{K-\pi}$  are the 2-BM normalization values which are used in combination with Table 3 to give the final background in Table 5. For KK (K $\pi$ ),  $\overline{CkTRS \cdot CkTAIL \cdot BWTRS}$  ( $\overline{C\pi iTRS \cdot C\pi iTAIL \cdot BWTRS}$ ) is applied

$Bkgrnd (\times 10^{-3})$	k034	e787	p21	p22	uncorr.	$N_{bkg}$
1- $BM$	$3.86 \pm 2.36$	$1.66 \pm 1.66$	$19.11 \pm 19.11$	$196.05 \pm 196.05$	$44.51 \pm 44.51$	$7.95 \pm 7.95$
2- $BM$ $KK$	$.983 \pm 0.98$	$145.9 \pm 145.9$	$81.39 \pm 41.64$	$88.31 \pm 35.50$	$168.0 \pm 52.8$	$30.0 \pm 9.4$
2- $BM$ $K\pi$	$.106 \pm 0.10$	$19.7 \pm 19.7$	$3.12 \pm 1.94$	$4.8 \pm 4.8$	$7.92 \pm 5.18$	$1.42 \pm 0.93$
<i>scaled by <math>KB_{Live}</math></i>						
2- $BM$	$1.14 \pm 1.14$	$165.6 \pm 165.6$	$84.51 \pm 41.68$	$639.58 \pm 265.08$	$175.95 \pm 53.0$	$31.44 \pm 9.45$
<i>Total</i>	$5.00 \pm 2.62$	$167.3 \pm 167.3$	$103.62 \pm 46.02$	$835.62 \pm 330.97$	$220.46 \pm 69.2$	$39.4 \pm 12.4$

Table 5: **Total Background. without  $K_{\pi 2}$  scatter cuts, acceptance corrected** Scaled to the 3/3 sample. k034 column is the result of e949-pnn1 analysis. e787 is the result of the e787-PNN2 analysis. The other columns are current results that are expanded upon throughout the rest of the tables. The errors are statistical.  $KB_{live}$  for k034 is  $1.77 \times 10^{12}$  and for e787 is  $1.71 \times 10^{12}$ . e787 background has been scaled up accordingly for comparison purposes.