```
*
************************************************
*           PION BETA SINGLE EVENT DISPLAY
************************************************
*
*  Kumac files to enable the study of the shower spreadings
*  in the calorimeter for pion beta and pi--->e nu decay events.
*  The single event display aided in the design of the clusters
*  as explained in chapter 7. In particular, figure 6.4 and
*  figure 7.10 were obtained from these routines which were
*  modified for the target single event display described in
*  chapter 8 --- KAA.
*
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*
*  (The macro sed.kumac was first written by Bryan Wright.)
*
                  MACRO CLUSTER
*
n_det=240
n_elements=[n_det]*6
number=9
*
ve/cr n_hit(1) r 9
ve/cr dethit([number])
ve/cr nsides([n_det])
ve/cr y([n_elements])
ve/cr x([n_elements])
ve/cr nfaci(8) r 444 305 395 365 350 345 395 395
ve/cr ncolor(8) r 3 2 4 6 5 7 4 4
*
ve/read nsides csi_nsides.dat
ve/read y,x csi_vertices.dat
*
event=0
exec calo
eventloop:
 event = [event]+1
 nsty = nfaci([event])
 nc = ncolor([event])
 idet=1
 ve/read dethit 'cl0'//[event]//'.dat'
 idetloop:
    deter=dethit([idet])
    k=nsides([deter])
    offset=[deter]-1
    offset=[offset]*6
    ib=[offset]+1
    ie=[offset]+[k]
```

```
    igset faci [nc]                                                    50
    igset fais 3
    igset fasi [nsty]
    farea [k] x([ib]:[ie]) y([ib]:[ie])
    idet = [idet]+1
    if [idet] <= n_hit(1) goto idetloop
if [event] < 8 goto eventloop
finished:
ve/de *
exec sed
return                                                                 60
*
************************************************************
*
                MACRO CALO
*
igset txfp -130
igset chhe 0.5
igset txci 1
exec plotsphere
itx -13 15 'Figure 6.9: Pion beta single event display showing some    70
           clusters and one supercluster'
itx -13  6 'as an ''OR'' of six clusters. The energy distribution
           (in MeV) of one pion beta decay'
itx -13 -3 'event is also shown. This event will fire the trigger since
           each of two diametrically'
itx -13 -12 'opposed clusters receive more than the threshold energy
           (50 MeV).'
return
*
************************************************************           80
*
                  MACRO SED
*
opt ntic
opt ndat
opt nbox
n_det=240
n_elements=[n_det]*6
*
ve/cr thr(1)                                                           90
ve/cr n_hit(1)
ve/cr dethit([n_det])
ve/cr detadc([n_det])
ve/cr xcent([n_det])
ve/cr ycent([n_det])
*
ve/read xcent,ycent csi_centroids.dat
*
```

```
hist/file 1 pibeta.rz 8192
event = 6                                                              100
nt/loop 9 getdet.for 1 [event]
if n_hit(1)=0 goto eventloop
n=n_hit(1)
igset txci 1
idet=1
idetloop:
    deter=dethit([idet])
    adc=detadc([idet])
    xtext=xcent([deter])
    ytext=ycent([deter])                                               110
    igset txci 2
    if [adc] >= 10 then
       txt = $substring([adc],1,4)
    else
       txt = $substring([adc],1,3)
    end if
    text [xtext] [ytext] [txt] 0.28 0.0
    idet=[idet]+1
if [idet] <= n_hit(1) goto idetloop
close 1                                                                120
ve/de *
return
*
**********************************************************************
*
              MACRO PLOTSPHERE
*
size 28 20
ve/cr x0(2)
ve/cr y0(2)                                                            130
ve/cr p1(1370)
ve/cr p2(1370)
ve/cr p3(1370)
ve/cr p4(1370)
*
opt ntic
null -15 362 20 158 ab
*
ve/read p1,p2,p3,p4 fuller.dat
count=1                                                                140
loop:
        y1=p1([count])
        x1=p2([count])
        y2=p3([count])
        x2=p4([count])
        ve/inp x0(1) [x1]
        ve/inp x0(2) [x2]
```

```
        ve/inp y0(1) [y1]
        ve/inp y0(2) [y2]
        pline 2 x0 y0                                                    150
        count=[count]+1
if [count] <= 1370 goto loop
return
*
*****************************************************************
*
*                    GETDET.FOR
*
*****************************************************************
*                                                                    160
      REAL FUNCTION GETDET(XDUMMY)
      LOGICAL          CHAIN
      CHARACTER*128    CFILE
*
      COMMON /PAWCHN/ CHAIN, NCHEVT, ICHEVT
      COMMON /PAWCHC/ CFILE
      COMMON/PAWIDN/IDNEVT,VIDN1,VIDN2,VIDN3,VIDN(10),
     +ETGT,ECLAD,EPVETO,ETARG,DETECT(240),ETOT,EWHOLE,W,
     +RELANG,PTGT,PCLAD,PPVETO,PTARG,PWHOLE,MESQ,EG1,EG2
*                                                                    170
      VECTOR N_HIT
      VECTOR DETHIT
      VECTOR DETADC
      VECTOR THR
*
      THR(1)=0.0
*
      DO 20 K=1,240
         DETECT(K) = 1000.0*DETECT(K)
 20   CONTINUE                                                        180
*
      N_HIT(1) = 0
      DO 100 I=1,240
         IF (DETECT(I).GT.THR(1)) THEN
            ISLOT = N_HIT(1) + 1
            DETHIT(ISLOT) = I
            DETADC(ISLOT) = DETECT(I)
            N_HIT(1) = ISLOT
            PRINT *, DETECT(I), I
         END IF                                                      190
100   CONTINUE
*
      END
```