```
nper0=57600l
norb=750l
nx=norb*nper0
nbin=100l
nout=nx/nbin
nper=nper0/nbin

noff=20l
;t0=q(0,0)
t0=16896905.D0-noff*nbin/10

;w0=where((q(3,*) ge 258.2) and (q(3,*) le 258.35) and (q(4,*) ge 259.59) and (q(4,*) le
 259.76) and (q(1,*) ge 120000) and (q(1,*) le 122000) and (q(2,*) ge 0) and (q(2,*) le
20) and (q(0,*) ge 1.6935d7) and (q(0,*) le 2.114d7),n0)
w0=where((q(3,*) ge 258.2) and (q(3,*) le 258.35) and (q(4,*) ge 259.59) and (q(4,*) le
259.76),n0)
;Old code. Problem when times are x.x5s.
;ix=long(round(10*(q(0,w0)-t0)))
ix=long(10*(q(0,w0)-t0+0.001))
g0=fltarr(nx)
g0(ix)=1
iy=lonarr(nx)
iy(ix)=w0

s1=long(round(100*rebin(g0,nout)))
g1=s1/100
w1=where(s1 eq nbin,n1)
c1=dblarr(nout)
b1=dblarr(nout)
x1=dblarr(nout)
y1=dblarr(nout)
vc1=dblarr(nout)
vb1=dblarr(nout)
vx1=dblarr(nout)
vy1=dblarr(nout)
rc1=dblarr(nout)
rb1=dblarr(nout)
rx1=dblarr(nout)
ry1=dblarr(nout)
for i=0l,n1-1 do begin
  i1=w1(i)
  ii=iy(nbin*i1:nbin*i1+99)
  qq=total(rebin(q(1,ii),1))
  c1(i1)=qq
  vc1(i1)=total((q(1,ii)-qq)^2)
  rc1(i1)=max(q(1,ii))-min(q(1,ii))
  qq=total(rebin(q(2,ii),1))
  b1(i1)=qq
  vb1(i1)=total((q(2,ii)-qq)^2)
  rb1(i1)=max(q(2,ii))-min(q(2,ii))
  qq=total(rebin(q(3,ii),1))
  x1(i1)=qq
  vx1(i1)=total((q(3,ii)-qq)^2)
  rx1(i1)=max(q(3,ii))-min(q(3,ii))
  qq=total(rebin(q(4,ii),1))
  y1(i1)=qq
  vy1(i1)=total((q(4,ii)-qq)^2)
  ry1(i1)=max(q(4,ii))-min(q(4,ii))
end
c1(w1)=c1(w1)-total(rebin(c1(w1),1))
b1(w1)=b1(w1)-total(rebin(b1(w1),1))
save,t0,nper,nbin,nout,norb,n1,b1,c1,x1,y1,vb1,vc1,vx1,vy1,rb1,rc1,rx1,ry1,w1,g1,filenam
e='/tmp80/schou/wire.001215/tweak.save'

end
```

```
;nin=8052650l
;nfile=365
;nin=10263681l
;nfile=366
nin=9796639
nfile=2
q=dblarr(5,nin)
openr,1,'list'
filename='qqq'
i0=0l
nl=0l
for i=0,nfile-1 do begin
  readf,1,nl,nw,nc,filename
  print,i,nl,i0,filename
  if (nl ne 0) then begin
    q1=dblarr(5,nl)
    openr,2,strcompress(filename,/remove_all)
    readf,2,q1
    close,2
    q(*,i0:i0+nl-1)=q1
    i0=i0+nl
  end
end
close,1

save,/variables,filename='/tmp80/schou/wire.001220/read.save'

nper0=57600l
norb=750l
nx=norb*nper0
nbin=100l
nout=nx/nbin
nper=nper0/nbin

noff=20l
;t0=q(0,0)
t0=16896905.D0-noff*nbin/10

;w0=where((q(3,*) ge 258.2) and (q(3,*) le 258.35) and (q(4,*) ge 259.59) and (q(4,*) le
 259.76) and (q(1,*) ge 120000) and (q(1,*) le 122000) and (q(2,*) ge 0) and (q(2,*) le
20) and (q(0,*) ge 1.6935d7) and (q(0,*) le 2.114d7),n0)
w0=where((q(3,*) ge 258.2) and (q(3,*) le 258.35) and (q(4,*) ge 259.59) and (q(4,*) le
259.76),n0)
;Old code. Problem when times are x.x5s.
;ix=long(round(10*(q(0,w0)-t0)))
ix=long(10*(q(0,w0)-t0+0.001))
g0=fltarr(nx)
g0(ix)=1
iy=lonarr(nx)
iy(ix)=w0

s1=long(round(100*rebin(g0,nout)))
g1=s1/100
w1=where(s1 eq nbin,n1)
c1=dblarr(nout)
b1=dblarr(nout)
x1=dblarr(nout)
y1=dblarr(nout)
vc1=dblarr(nout)
vb1=dblarr(nout)
vx1=dblarr(nout)
vy1=dblarr(nout)
rc1=dblarr(nout)
rb1=dblarr(nout)
rx1=dblarr(nout)
ry1=dblarr(nout)
for i=0l,n1-1 do begin
  i1=w1(i)
  ii=iy(nbin*i1:nbin*i1+99)
  qq=total(rebin(q(1,ii),1))
  c1(i1)=qq
  vc1(i1)=total((q(1,ii)-qq)^2)
  rc1(i1)=max(q(1,ii))-min(q(1,ii))
  qq=total(rebin(q(2,ii),1))
  b1(i1)=qq
  vb1(i1)=total((q(2,ii)-qq)^2)
  rb1(i1)=max(q(2,ii))-min(q(2,ii))
  qq=total(rebin(q(3,ii),1))
  x1(i1)=qq
  vx1(i1)=total((q(3,ii)-qq)^2)
  rx1(i1)=max(q(3,ii))-min(q(3,ii))
  qq=total(rebin(q(4,ii),1))
  y1(i1)=qq
  vy1(i1)=total((q(4,ii)-qq)^2)
  ry1(i1)=max(q(4,ii))-min(q(4,ii))
end
c1(w1)=c1(w1)-total(rebin(c1(w1),1))
b1(w1)=b1(w1)-total(rebin(b1(w1),1))
save,t0,nper,nbin,nout,norb,n1,b1,c1,x1,y1,vb1,vc1,vx1,vy1,rb1,rc1,rx1,ry1,w1,g1,filename
='/tmp80/schou/wire.001220/tweak.save'

end
```

```
b1=reform(b1,nper,norb,/overwrite)
c1=reform(c1,nper,norb,/overwrite)
x1=reform(x1,nper,norb,/overwrite)
y1=reform(y1,nper,norb,/overwrite)

vb1=reform(vb1,nper,norb,/overwrite)
vc1=reform(vc1,nper,norb,/overwrite)
vx1=reform(vx1,nper,norb,/overwrite)
vy1=reform(vy1,nper,norb,/overwrite)

rb1=reform(rb1,nper,norb,/overwrite)
rc1=reform(rc1,nper,norb,/overwrite)
rx1=reform(rx1,nper,norb,/overwrite)
ry1=reform(ry1,nper,norb,/overwrite)

g1=reform(g1,nper,norb,/overwrite)

fout=1d6*dindgen(nout)*10/nout/nbin
fout1=1d6*(((dindgen(nout)+nout/2) mod nout)-nout/2)*10/nout/nbin

iorb=rebin(reform(dindgen(norb),1,norb),nper,norb)
iper=rebin(reform(dindgen(nper),nper,1),nper,norb)

worb=where(rebin(g1+0.0,1,norb) ne 0,nworb)

w1a=where((g1 ne 0) and (vx1 le 0.004) and (vy1 le 0.004),n1a)
g1a=intarr(nper,norb)
g1a(w1a)=1

g2=intarr(nper,norb)

x2=dblarr(nper,norb)
y2=dblarr(nper,norb)

ix=dindgen(nper)
for i=0l,norb-1 do begin
;for i=320,320 do begin
  w=where(g1a(*,i) ne 0,n)
  if (n ne 0) then begin
    xx=x1(*,i)-poly(ix,poly_fit(w,x1(w,i),2))
    yy=y1(*,i)-poly(ix,poly_fit(w,y1(w,i),2))
    w=where((g1a(*,i) ne 0) and (abs(xx) le 0.01) and (abs(yy) le 0.01),nx)
    xx1=x1(*,i)-poly(ix,poly_fit(w,x1(w,i),2))
    yy1=y1(*,i)-poly(ix,poly_fit(w,y1(w,i),2))
    w=where((g1a(*,i) ne 0) and (abs(xx1) le 0.0075) and (abs(yy1) le 0.0075),nx1)
    x2(w,i)=xx1(w)
    y2(w,i)=yy1(w)
    g2(w,i)=1
  end
end
;g2(0:59,*)=0
w2=where(g2 ne 0,n2)

c2=dblarr(nper,norb)
c2(w2)=c1(w2)
;c2(w2)=0
;for i=2400,2400,8 do c2(w2)=c2(w2)+sin(2*!pi*i*1e-6*w2*10)
mean2=reform(rebin(c2,1,norb)/(rebin(g2+0.0,1,norb)>1e-10))
q=rebin(reform(mean2,1,norb),nper,norb)
c2a=dblarr(nper,norb)
c2a(w2)=c2(w2)-q(w2)

np0=50
cg2=total(rebin(iper(np0:*,*)*g2(np0:*,*),1)/rebin(g2(np0:*,*)+0.0,1))
np2=2
px=dblarr(np2+1,norb)
for i=0,norb-1 do begin
  w=where(g2(np0:*,i) ne 0,n)
  if (n gt 0) then begin
    px(*,i)=poly_fit(w+np0-cg2,c2(np0+w,i),np2)
  end
end

ibreak=313
px1=dblarr(np2+1,norb)
wl=worb(where(worb lt ibreak))
wh=worb(where(worb ge ibreak))
px1=px*0
;px1(0,*)=px(0,*)
;px1(1,0:ibreak-1)=total(rebin(px(1,wl),1))
;px1(1,ibreak:*)=total(rebin(px(1,wh),1))
px1(1,0:ibreak-1)=poly(dindgen(ibreak),poly_fit(wl,px(1,wl),2))
px1(1,ibreak:*)=poly(ibreak+dindgen(norb-ibreak),poly_fit(wh,px(1,wh),2))
;px1(2,*)=poly(dindgen(norb),poly_fit(worb,px(2,worb),2))
;px1=px

c3=dblarr(nper,norb)
for i=0,norb-1 do begin
  w=where(g2(*,i) ne 0,n)
  if (n gt 0) then begin
    c3(w,i)=c2(w,i)-poly(w-cg2,px1(*,i))
  end
end

npol4=0
nc4=1

;c3=c2

;q4=dblarr(101)
;for ii=0,100 do begin

a=dblarr(nper,1+npol4+nc4)
for i=0,npol4 do a(*,i)=(dindgen(nper)-cg2)^i
a(*,npol4+1)=exp(-0.11*dindgen(nper))
;a(*,npol4+1)=exp(-0.002*ii*dindgen(nper))

coeff4=dblarr(1+npol4+nc4,norb)
for i=0,norb-1 do begin
  w=where(g2(*,i) ne 0,n)
  wx=where(g2(*,i) ne 0,nx)
  if (n gt 0) then begin
    xi=c3(w,i)
    ai=a(w,*)
    ci=invert(transpose(ai)#ai)#(transpose(ai)#xi)
    coeff4(*,i)=ci
  end
end

coeff4a=coeff4*0
coeff4a(0,*)=coeff4(0,*)
;coeff4a(0,worb)=poly(worb,poly_fit(worb,coeff4(0,worb),2))
;coeff4a(1,worb)=poly(worb,poly_fit(worb,coeff4(1,worb),2))
;coeff4a(2,worb)=poly(worb,poly_fit(worb,coeff4(2,worb),2))
;coeff4a(npol4+1,worb)=poly(worb,poly_fit(worb,coeff4(npol4+1,worb),3))
wl=worb(where(worb lt ibreak))
wh=worb(where(worb ge ibreak))
coeff4a(npol4+1,0:ibreak-1)=poly(dindgen(ibreak),poly_fit(wl,coeff4(npol4+1,wl),1))
coeff4a(npol4+1,ibreak:*)=poly(ibreak+dindgen(norb-ibreak),poly_fit(wh,coeff4(npol4+1,wh)
,1))
;coeff4a=coeff4

c4=dblarr(nper,norb)
for i=0,norb-1 do begin
```

```
  w=where(g2(*,i) ne 0,n)
  wx=where(g2(*,i) ne 0,nx)
  if (n gt 0) then begin
    xi=c3(w,i)
    ai=a(w,*)
    ci=coeff4a(*,i)
    c4(wx,i)=c3(wx,i)-a(wx,*)#ci
  end
end

;q4(ii)=total(c4^2)
;print,ii,q4(ii)
;end

av4=rebin(c4(*,worb),nper,1)/(rebin(g2(*,worb)+0.0,nper,1)>1e-6)
c5=dblarr(nper,norb)
c5(w2)=c4(w2)-av4(w2 mod nper)

;c4=reform(c6,432000)
;c5=reform(c7,432000)
;w2=w6

p4=abs(fft(reform(c4,nout),1))^2
p5=abs(fft(reform(c5,nout),1))^2

p5x=fltarr(4,nout)
for i=0,3 do begin
  wx=w2(where((w2 ge (-3000+120000*i)) and (w2 lt (-3000+120000*(i+1))),nx))
  q=fltarr(nout)
  q(wx)=c5(wx)
  p5x(i,*)=abs(fft(q,1))^2
end
p5y=reform(rebin(p5x,1,nout))

psl,file='qqq.ps'
plot,fout,p5,xrange=[500,4000],yrange=[0,1.5e9]
!p.multi=[0,4,2]
for i=0,5 do begin
  for j=0,3 do plot,fout,p5x(j,*),xrange=[1200,1500]+300*i,yrange=[0,1e8]
  plot,fout,p5y,xrange=[1200,1500]+300*i,yrange=[0,5e7]
  plot,fout,p5,xrange=[1200,1500]+300*i,yrange=[0,4e8]
  plot,fout,rebin(rebin(p5,108000),432000),xrange=[1200,1500]+300*i,yrange=[0,2e8]
  plot,fout,p4,xrange=[1200,1500]+300*i,yrange=[0,4e8]
end
!p.multi=[0,3,2]
for i=0,5 do begin
  plot,fout,p5y,xrange=[1200,1500]+300*i
  for j=0,40 do oplot,[0,0]+173.61*j,[0,1e9],linestyle=2
end
psend1
xwin
!p.multi=0

stop

b1x=b1
c1x=c1
for i=0l,norb-1 do begin
  i0=(i*nper-noff)>0
  w=where(g1(i0:i0+nper-1) ne 0,n)
  if (n gt 0) then begin
    b1x(i0+w)=b1x(i0+w)-total(rebin(b1x(i0+w),1))
    c1x(i0+w)=c1x(i0+w)-total(rebin(c1x(i0+w),1))
  end
end
w1m=(w1+noff) mod nper
wx=w1(where(w1m ge 70))

;p=poly_fit(b1x(wx),c1x(wx),1)
;c1x(w1)=c1x(w1)-poly(b1x(w1),p)

lchunk=5l
nchunk=norb/lchunk
w2=w1
for it=0,3 do begin
  cx=dblarr(nout)
  cx(w2)=c1x(w2)
  c2=dblarr(nout)
  qq=dblarr(101,nchunk)
  qx=dblarr(101)
  emin=dblarr(nchunk)
  for i2=0,nchunk-1 do begin
    ww=where((w2 ge i2*lchunk*nper) and (w2 lt (i2+1)*lchunk*nper),n2)
    if (n2 ne 0) then begin
      wx=w2(ww)
      wxm=(wx+noff) mod nper
      c2xw=cx(wx)
      a=dblarr(n2,3)
      a(*,0)=1
      a(*,1)=wxm-total(rebin(wxm,1))
      xi=660.D0/nbin
      sm=1e6
      i=0
      for i=0,100 do begin
        xi=3.50D0*2^(3*0.01*i)
        qx(i)=xi
        a(*,2)=exp(-wxm/xi)
        b=transpose(a)#a
        c=invert(b)#(transpose(a)#c2xw)
        m=a#c
        smx=total(rebin((c2xw-m)^2,1))
        if (smx le sm) then begin
          sm=smx
          emin(i2)=xi
          c2(wx)=c2xw-m
        end
        qq(i,i2)=smx
      end
      print,i2,n2,emin(i2)
    end
  end
  wx=w2(where(abs(c2(w2)) le 70,n2))
  w2=wx
  print,it,n2
end
g2=dblarr(nout)
g2(w2)=1

p1=abs(fft(c1,1))^2
p1x=abs(fft(c1x,1))^2
p2=abs(fft(c2,1))^2

c3=c2
for i=0l,norb-1 do begin
  i0=(i*nper-noff)>0
  w=where(g2(i0:i0+nper-1) ne 0,n)
  if (n gt 0) then begin
    im=total(rebin(w,1))
    xw=c3(i0+w)
    pol=poly_fit(w-im,xw,0)
    c3(i0+w)=xw-poly(w-im,pol)
    print,i,n,i0,im,reform(pol)
  end
end
p3=abs(fft(c3,1))^2
```

```
c4=c2
for i=0l,norb-1 do begin
  i0=(i*nper-noff)>0
  w=where(g2(i0:i0+nper-1) ne 0,n)
  if (n gt 0) then begin
    im=total(rebin(w,1))
    xw=c4(i0+w)
    pol=poly_fit(w-im,xw,1)
    c4(i0+w)=xw-poly(w-im,pol)
    print,i,n,reform(pol)
  end
end
p4=abs(fft(c4,1))^2

p5=p3
pq=173.62D0
p5(where(pq*abs(fout/pq-round(fout/pq)) le 1))=0

w2m=w2 mod nper
w6=w2(where((w2m le 228) or (w2m ge 571),n6))
c6=dblarr(nout)
c6(w6)=c3(w6)
g6=dblarr(nout)
g6(w6)=1
p6=abs(fft(c6,1))^2

c6x=reform(rebin(reform(c6,nper,750),nper,1))
g6x=reform(rebin(reform(g6,nper,750),nper,1))
m6x=c6x/(g6x>1e-20)

c7=dblarr(nout)
c7(w6)=c6(w6)-m6x(w6 mod nper)
p7=abs(fft(c7,1))^2

save,c6,c7,nout,nbin,fout,w6,g6,n6,p6,p7,filename='/tmp80/schou/wire.001215/p.save'

qx=exp(-(dindgen(31)-15)^2)

psl,file='ts.ps'
plot,10*w1,c1(w1),psym=3,xtitle='Time (s)',title='Original time series'
plot,10*w6,c7(w6),psym=3,xtitle='Time (s)',title='Final time-series'
plot,rebin(g6,750),psym=10,xtitle='Orbit #',ytitle='Duty cycle'
pg6=abs(fft(g6,1))^2
ix=(lindgen(nout)+nout/2) mod nout
w=where(abs(fout1(ix)) le 1000)
plot,fout1(ix(w)),pg6(ix(w))/pg6(0),xtitle='!7m(l!3Hz)',title='Window function'
plot_io,fout1(ix(w)),pg6(ix(w))/pg6(0),xtitle='!7m(l!3Hz)',title='Window function'
plot,fout1(ix(w)),pg6(ix(w))/pg6(0),xrange=[-20,20],xtitle='!7m(l!3Hz)',title='Window fu
nction'
psend1
xwin

psl,file='plot1a.ps'
plot,fout,p3,xrange=[1000,5000],yrange=[0,5e8]
for i=0,40 do oplot,[0,0]+i*pq,[1,1e10],linestyle=2
plot,fout,p3,xrange=[1500,3000],yrange=[0,5e8]
for i=0,40 do oplot,[0,0]+i*pq,[1,1e10],linestyle=2
psend1
xwin

psl,file='plot1.ps'
plot,fout,p5,xrange=[1000,5000],yrange=[0,5e8]
for i=0,40 do oplot,[0,0]+i*pq,[1,1e10],linestyle=2
plot,fout,p5,xrange=[1500,3000],yrange=[0,5e8]
for i=0,40 do oplot,[0,0]+i*pq,[1,1e10],linestyle=2
psend1
xwin

!p.multi=[0,1,6]
ps,file='plot2.ps'
device,ysize=25,yoffset=1
for j=8,49 do begin
  plot,fout,p5,xrange=[108*j,108*j+150],xstyle=1
  for i=0,40 do oplot,[0,0]+i*pq,[1,1e10],linestyle=2
end
psend1
xwin
!p.multi=0

!p.multi=[0,1,5]
ps,file='plot3.ps'
device,ysize=25,yoffset=1
for j=0,9 do begin
  plot,fout,p5,xrange=[540*j,540*j+900],xstyle=1
  for i=0,40 do oplot,[0,0]+i*pq,[1,1e10],linestyle=2
end
psend1
xwin
!p.multi=0

stop
;i0=5000l
;for i=0,20 do tv,bytscl(alog20(convol(reform(p5(i0:i0+(460+1*i)*40l-1),460+1*i,40),[1,2,
1]/4.)),7.0,8.5),i

spg6=dblarr(200000)
spg6(0)=pg6(0)
for i=1l,199999 do spg6(i)=spg6(i-1)+2*pg6(i)

g6x=dblarr(432000)
g6x(where((lindgen(432000) mod 576) lt 224))=1
pg6x=abs(fft(g6x,1))^2
spg6x=dblarr(200000)
spg6x(0)=pg6x(0)
for i=1l,199999 do spg6x(i)=spg6x(i-1)+2*pg6x(i)

end
```

```
nper0=57600l
norb=750l
nx=norb*nper0
nbin=100l
nout=nx/nbin
nper=nper0/nbin

noff=20l
;t0=q(0,0)
t0=16896905.D0-noff*nbin/10

;w0=where((q(3,*) ge 258.2) and (q(3,*) le 258.35) and (q(4,*) ge 259.59) and (q(4,*) le
 259.76) and (q(1,*) ge 120000) and (q(1,*) le 122000) and (q(2,*) ge 0) and (q(2,*) le
20) and (q(0,*) ge 1.6935d7) and (q(0,*) le 2.114d7),n0)
w0=where((q(3,*) ge 258.2) and (q(3,*) le 258.35) and (q(4,*) ge 259.59) and (q(4,*) le
259.76),n0)
;Old code. Problem when times are x.x5s.
;ix=long(round(10*(q(0,w0)-t0)))
ix=long(10*(q(0,w0)-t0+0.001))
g0=fltarr(nx)
g0(ix)=1
iy=lonarr(nx)
iy(ix)=w0

s1=long(round(100*rebin(g0,nout)))
g1=s1/100
w1=where(s1 eq nbin,n1)
c1=dblarr(nout)
b1=dblarr(nout)
x1=dblarr(nout)
y1=dblarr(nout)
vc1=dblarr(nout)
vb1=dblarr(nout)
vx1=dblarr(nout)
vy1=dblarr(nout)
rc1=dblarr(nout)
rb1=dblarr(nout)
rx1=dblarr(nout)
ry1=dblarr(nout)
for i=0l,n1-1 do begin
  i1=w1(i)
  ii=iy(nbin*i1:nbin*i1+99)
  qq=total(rebin(q(1,ii),1))
  c1(i1)=qq
  vc1(i1)=total((q(1,ii)-qq)^2)
  rc1(i1)=max(q(1,ii))-min(q(1,ii))
  qq=total(rebin(q(2,ii),1))
  b1(i1)=qq
  vb1(i1)=total((q(2,ii)-qq)^2)
  rb1(i1)=max(q(2,ii))-min(q(2,ii))
  qq=total(rebin(q(3,ii),1))
  x1(i1)=qq
  vx1(i1)=total((q(3,ii)-qq)^2)
  rx1(i1)=max(q(3,ii))-min(q(3,ii))
  qq=total(rebin(q(4,ii),1))
  y1(i1)=qq
  vy1(i1)=total((q(4,ii)-qq)^2)
  ry1(i1)=max(q(4,ii))-min(q(4,ii))
end
c1(w1)=c1(w1)-total(rebin(c1(w1),1))
b1(w1)=b1(w1)-total(rebin(b1(w1),1))
save,t0,nper,nbin,nout,norb,n1,b1,c1,x1,y1,vb1,vc1,vx1,vy1,rb1,rc1,rx1,ry1,w1,g1,filenam
e='/tmp80/schou/wire.001220/tweak.save'

end
```