This procedure, *HistDiscont(XBins, YBins, RemoveBins)*, takes the arrays *XBins* and *YBins* of a SPIFI spectrum, which have already had the bins in the list *RemoveBins* removed. I.e., XBins data points may not be equally spaced. It outputs the global variable *histdiscont*, which is a list of Line Plot Structures which make up the histogram of the given SPIFI spectrum. To see the histogram, one must subsequently use the display() command with *histdiscont* as an argument. This procedure requires loading the with(plots) and with(plottools) packages.

```
> HistDiscont:=proc(Xdata,Ydata)
> local Numbins, StandardBinlength, Endpoints, Binlines,
  Binlengths, i: global Histogram:
> Histogram:=[]:
> Numbins:=nops(Xdata):
> for i from 1 to nops(Xdata)-1 do
> Binlengths[i]:=abs(Xdata[i]-Xdata[i+1]): end do:
> StandardBinlength:=min(describe[mode](convert(Binlengths,list))):
> Endpoints[1]:=[Xdata[1]+StandardBinlength/2,Ydata[1]]:
> Endpoints[2*Numbins]:=[Xdata[Numbins]-StandardBinlength/2,Ydata
  [Numbins]]:
> for i from 1 to Numbins-1 do
> if (StandardBinlength-0.65*StandardBinlength) < Binlengths[i] and
> Binlengths[i] < (StandardBinlength+0.65*StandardBinlength) then
> Endpoints[2*i]:=[Xdata[i]-Binlengths[i]/2,Ydata[i]]:
> Endpoints[2*i+1]:=[Xdata[i+1]+Binlengths[i]/2,Ydata[i+1]]:
> else
> Endpoints[2*i]:=[Xdata[i]-StandardBinlength/2,Ydata[i]]:
> Endpoints[2*i+1]:=[Xdata[i+1]+StandardBinlength/2,Ydata[i+1]]:
> end if: end do:
> for i from 0 to Numbins-1 do
> Binlines[2*i+1]:=line(Endpoints[2*i+1],Endpoints[2*i+2]):
> end do:
> for i from 1 to Numbins-1 do
> if (StandardBinlength-0.65*StandardBinlength) < Binlengths[i] and
  Binlengths[i] < (StandardBinlength+0.5*StandardBinlength) then
> Binlines[2*i]:=line(Endpoints[2*i],Endpoints[2*i+1]):
> end if: end do:
> Histogram:=convert(Binlines,list):
> end proc:
```