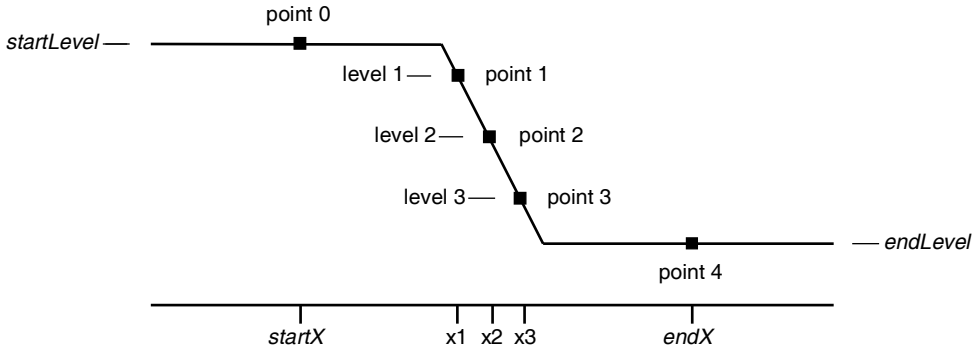
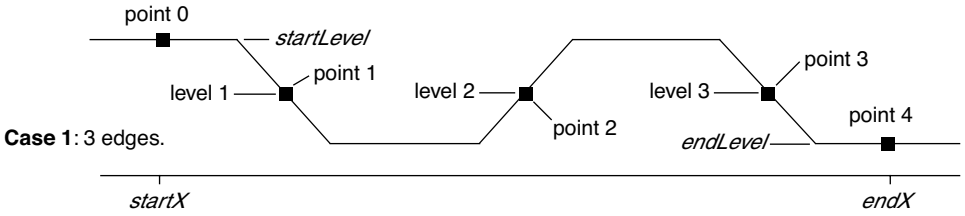


EdgeStats is based on the same principles as FindLevel. EdgeStats does not work on an XY pair. See **Converting XY Data to a Waveform** on page III-109.

Pulse Statistics

The **PulseStats** operation (see page V-783) produces simple statistics (measurements) on a region of a wave that is expected to contain three edges as shown below. If more than three edges exist, PulseStats works on the first three edges it finds. PulseStats handles two other cases in which there are only one or two edges. The pulse statistics are stored in special variables which are described in the PulseStats reference.



PulseStats is based on the same principles as EdgeStats. PulseStats does not work on an XY pair. See **Converting XY Data to a Waveform** on page III-109.

Peak Measurement

The building block for peak measurement is the FindPeak operation. You can use it to build your own peak measurement procedures or you can use procedures provided by WaveMetrics.

Our Multipeak Fitting package provides a powerful GUI and programming interface for curve fitting to peak data. It can fit a number of peak shapes and baseline functions. A demo experiment provides an introduction - choose File→Example Experiments→Curve Fitting→Multipeak Fit Demo.

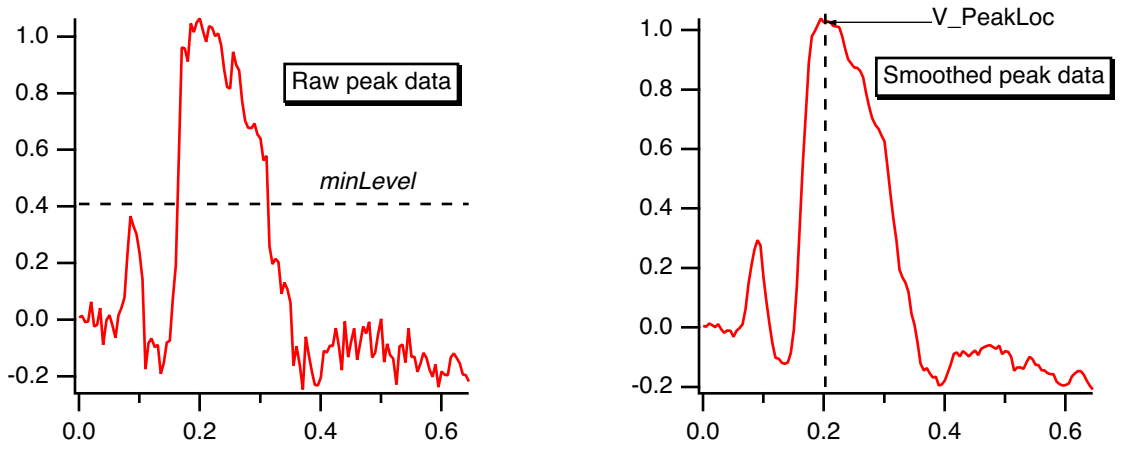
We have created several peak finding and peak fitting Technical Notes. They are described in a summary Igor Technical Note, TN020s-Choosing a Right One.ifn in the Technical Notes folder. There is also an example experiment, called Multi-peak Fit, that does fitting to multiple Gaussian, Lorentzian and Voigt peaks. Multi-peak Fit is less comprehensive but easier to use than Tech Note 20.

The **FindPeak** operation (see page V-247) searches a wave for a minimum or maximum by analyzing the smoothed first and second derivatives of the wave. The smoothing and differentiation is done on a copy of the input wave (so that the input wave is not modified). The peak maximum is detected at the smoothed first derivative zero-crossing, where the smoothed second derivative is negative. The position of the minimum or maximum is returned in the special variable V_PeakLoc. This and other special variables set by FindPeak are described in the operation reference.

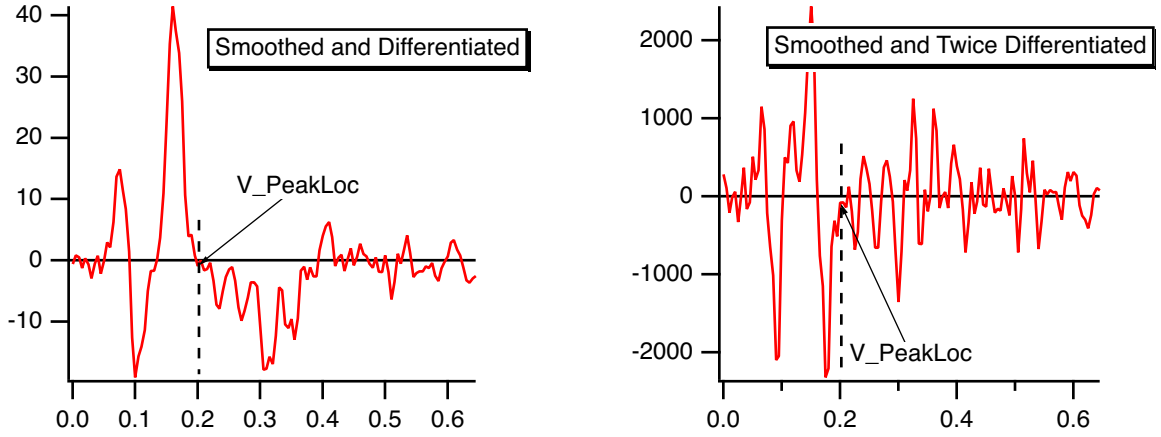
The following describes the process that FindPeak goes through when it executes a command like this:

```
FindPeak/M=0.5/B=5 peakData   // 5 point smoothing, min level = 0.5
```

The box smoothing is performed first:



Then two central-difference differentiations are performed to find the first and second derivatives:



If you use the /M=*minLevel* flag, FindPeak ignores peaks that are lower than *minLevel* (i.e., the Y value of a found peak must exceed *minLevel*). The *minLevel* value is compared to the *smoothed* data, so peaks that appear to be large enough in the raw data may not be found if they are very near *minLevel*. If /N is also specified (search for minimum or "negative peak"), FindPeak ignores peaks whose amplitude is greater than *minLevel* (i.e., the Y value of a found peak will be *less* than *minLevel*). For negative peaks, the peak minimum is at the smoothed first derivative zero-crossing, where the smoothed second derivative is positive.

This command shows an example of finding a negative peak:

```
FindPeak/N/M=0.5/B=5 negPeakData     // 5 point smoothing, max level=0.5
```