

Command	APOLISH
<b>PURPOSE</b>	Eliminate strong deviations in analyzer data
<b>PARAMETERS</b>	
ANLID	Name of analyzer to be listed
/LIMITS(x1,x2)	Consider only the part of the spectrum within the given limits
/CONDITION(c)	Consider only the part of the spectrum within the condition “c”
/WINDOW(c)	Consider only the part of the spectrum within the window “c”
/ZEROES	Include channels with zero content to the procedure. By default, these channels are not considered.
/FWHM(r)	As first operation, the spectrum is smoothed by averaging a range of neighboring channels, specified by “r”. This option is useful to eliminate or to reduce statistical fluctuations or to make the further treatment insensitive to a fine structure in the spectrum.
/MAXIMUM	Assume that the original spectrum has negative curvature everywhere. (If the parameter CURVATURE(r) is specified in addition, only curvatures below this limiting value are allowed. See also below.) That means that peaks are considered to be true, dips are considered to be due to missing counts in some localized regions. Regions of the spectrum which would lead to curvature above the limiting value are disregarded.
/MINIMUM	Assume that the original spectrum has positive curvature everywhere. (If the parameter CURVATURE(r) is specified in addition, only curvatures above this limiting value are allowed. See also below.) That means that dips are considered to be true, peaks are considered to be due to some localized background. Regions of the spectrum which would lead to curvature below the limiting value are disregarded.
/CURVATURE(r)	The value “r” specifies a value for the limiting curvature used in the /MIN or /MAX option. The default value is zero.
/INTERPOL	The regions of the spectrum which are disregarded due to the /MAX or /MIN option are obtained by interpolation of the neighboring points.
/POLYNOMIAL(i)	The resulting spectrum is represented by a polynomial of degree “i”.
/SMOOTH(r)	If a value ( $r \geq 0$ ) is given for this parameter, the regions of the spectrum which are disregarded due to the /MAX or /MIN option are obtained by smoothing on the basis of the rest of the spectrum. The parameter “r” gives the allowed deviations of the smoothed curve from the data points.
/STATISTICS	Assume that the data points have statistical uncertainties due to Poisson statistics. This determines the weights of the data points for the polynomial and the smooth options.
/DESTINATION(c)	Gives the name of the destination analyzer to which the resulting “polished” spectrum is written.
<b>FUNCTION</b>	The command tries to restore spectra which are disturbed by regions of localized background (spurious peaks) or regions of localized insensitivity (spurious dips). The procedure is applicable to a spectrum

for which the curvature of the true undisturbed spectrum is limited to values above or below a certain value.

The procedure works in several steps:

1. Smoothing by averaging of a region of neighboring channels. (This option is active only if the /FWHM parameter is > 0.)
2. Exclusion of those regions of the spectrum which exceed the limiting curvature.
3. Presentation of the restored spectrum as a polygon (by interpolation), as a polynomial or as a smooth curve.
4. Output of the restored spectrum to a destination analyzer.

## REMARKS

The polishing procedure is only applicable if most part of the spectrum is undisturbed and if the spectrum is generally smooth.

## EXAMPLE

```
APOLISH AIN / FWHM(5) WIN(A) MIN POL(3) DEST(AOUT)
```

Restore the spectrum AIN on the basis of the region inside the window "A". Firstly, the spectrum is smoothed by averaging over a region of 5 channels. Regions with a positive curvature are eliminated. The remaining spectrum is represented by a polynomial of degree 3. Finally, the restored spectrum is written to the analyzer AOUT. If the destination analyzer does not exist, it is created with the attributes of the input analyzer.

The figure shows a typical application of the command APOLISH. Several peaks appear on the smooth spectrum of the input analyzer (red histogram). Treating the input analyzer with the command APOLISH / MIN SMOOTH(1) removes the peaks and reestablishes the smooth component of the spectrum (blue histogram). (The value of the /SMOOTH option should be varied to obtain an optimum value.) This procedure is useful to quickly determine a smooth background without the need to setting fit windows in order to eliminate the peak regions individually.

