



sino

NAME

sino - Calculate signal to noise ratio (1D)

SYNTAX

sino [real] [noprint]

DESCRIPTION

The command **sino** calculates the signal to noise ratio of a 1D spectrum according to the formula:

$$SINO = \frac{maxval}{2 \cdot noise}$$

where *maxval* is highest intensity in the signal region. The signal region is determined by the processing parameters SIGF1 and SIGF2. If SIGF1 = SIGF2, the signal region is defined by:

- the entire spectrum minus the first 16th part (if the scaling region file is not defined)
- the regions defined in the scaling region file NUC1.SOLVENT where NUC1 and SOLVENT are acquisition status parameters.


Standard scaling region files can be installed with **expinstall** and can be edited with **edlist scl**.

The factor *noise* is calculated according to the algorithm shown in [Figure 8.16](#).

Figure 8.16

$$\text{noise} = \sqrt{\frac{\sum_{i=-n}^n y(i)^2 - \frac{1}{N} \left(\sum_{i=-n}^n y(i) \right)^2 + \frac{3 \cdot \left(\sum_{i=1}^n i(y(i) - y(-i)) \right)^2}{N^2 - 1}}{N - 1}}$$

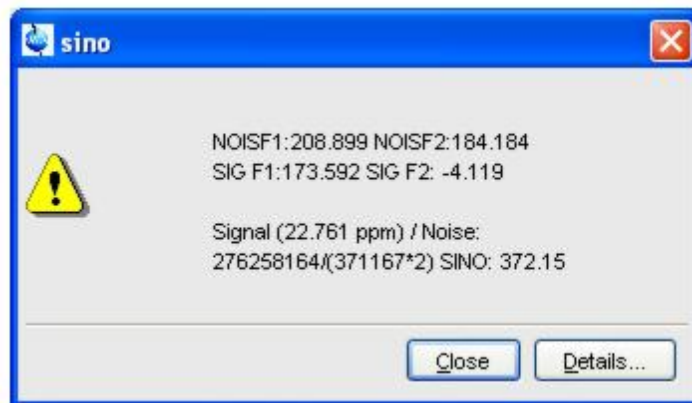
where N is the total number of points in the noise region, $n = (N-1)/2$, and $y(i)$ is the i th point in the noise region. The limits of the noise region is determined by the processing parameters NOISF1 and NOISF2. If they are equal, the first 1/16th of the spectrum is used as the noise region.

The parameters SIGF1, SIGF2, NOISF1 and NOISF2 can be set from the command line, from the **Procvars** tab (command **edp**) or, interactively, in Signal/Noise display mode. The latter can be entered by clicking **Analysis**  **Signal/Noise Calculation** or by entering **.sino** on the command line.

sino internally performs a peak picking to determine the highest peak in the signal region.

The result of **sino** appears on the screen, for example:

Figure 8.17



sino noprint does not show the result on the screen. The **noprint** option is

automatically set when **sino** is part of an AU program. The result of **sino** is also stored in the processing status parameter SINO which can be viewed with **s sino** or **dpp**.

sino real skips the magnitude calculation and works on the real data. Note that **sino** without argument first performs a magnitude calculation and then calculates the signal to noise ratio on the magnitude data.

The parameter SINO exists as processing parameter (**edp**) and as processing status parameter (**dpp**) and they have different functions. The latter is used to store the result of the command **sino** as discussed above. The former can be used to specify a signal to noise ratio which must be reached in an acquisition (see the parameter SINO in chapter [2.4](#) and the AU program **au_zgsino**).

INPUT PARAMETERS

set in **.sino** display mode, with **edp** or by typing **noisf1**, **noisef2** etc.:

NOISF1 - low field (left) limit of the noise region
 NOISF2 - high field (right) limit of the noise region
 SIGF1 - low field (left) limit of the signal region
 SIGF2 - high field (right) limit of the signal region

set by the acquisition, can be viewed with **dpa** or by typing **s nuc1** etc.:

NUC1 - observe nucleus
 SOLVENT - sample solvent

OUTPUT PARAMETERS

can be viewed with **dpp** or by typing **s sino** :

SINO - signal to noise ratio

INPUT FILES

<dir>/data/<user>/nmr/<name>/<expno>/pdata/<procno>/

1r - real processed 1D data
 1i - imaginary processed data (not used for **sino real**)
 proc - processing parameters

<tshome>/exp/stan/nmr/lists/scl/

<NUC1.SOLVENT> - scaling region file

OUTPUT FILES

<dir>/data/<user>/nmr/<name>/<expno>/pdata/<procno>/

procs - processing status parameters

USAGE IN AU PROGRAMS

SINO

Related Topics

[mc](#), [abs](#), [absf](#), [absd](#), [bas](#)