Command	AOPER

PURPOSE   Perform arithmetic operations with whole analyzers

PARAMETERS

AOUT	Target analyzer name.
=	Assignment symbol; required delimiter.
AIN1	First operand analyzer name
	or
	function with 1 or two operands:
	MIN(A1,A2) minimum of the two operands
	MAX(A1,A2) maximum of the two operands
	CONV(A1,A2) convolution of the two operands
	ABS(A1) absolute value of the operand
	EXP(A1) exponential of the operand
	LOG(A1) natural logarithm of the operand
	SQRT(A1) square root of the operand.
	The one or two operands may be analyzer, constant value or global parameter.
	If an analyzer name is given, further parameters may be specified; if a function is given, no further parameters are allowed.
OPERATOR	Operator. May be one of the following symbols:
	+ addition
	- subtraction
	* multiplication
	: division
	** raise to the power of …
AIN2	Second operand, may be
	an analyzer name,
	a constant numerical value, or
	a global parameter.
/DATA	Write only data to the target analyzer, no conditions and display windows. This is the default option
/CONDITIONS	Write only conditions to target analyzer
/WINDOWS	Write only display windows to target analyzer
	The options /DATA, /CONDITIONS and /WINDOWS may be combined.

FUNCTION   For each corresponding bin of analyzers AIN1 and AIN2 the specified arithmetic operation is performed; the result is stored in analyzer AOUT.
Special option: Conversion of 2-dim. analyzer to array of 1-dim. analyzers and back. See example below. For more complex conversions look the command ACONVERT.

REMARKS   If operator and second operand are omitted, the contents of analyzer AIN1 are stored in analyzer AOUT. The numbers of

dimensions of AIN1, AOUT1 and (eventually) AIN2 must be equal. If the analyzer AOUT does not exist, it is created as floating point analyzer with suitable bin size and channel limits.

If attached error analyzers (analyzers which contain the uncertainties of the data values) are provided, they are treated as well in an appropriate way, suited to the operation performed. E.g. if two analyzers are added, the uncertainties are determined as the square root of the sum of the squares of the uncertainties of the source analyzers.

In general, the limits and bin sizes of all analyzers involved must be equal. There is one exception: The simple copy of data from one analyzer to another (AOPER A = B) is also performed, if limits and bin sizes of source and destination analyzers are different. However, the mode of the analyzers must be analog. The counts are distributed according to the overlap of bins in source and destination analyzers. In this way, the shape and the moments of the source analyzer are preserved as exactly as possible.

If an error condition occurs, the corresponding value(s) on the output analyzer is set to –1, and a message is given after completion of the command.

EXAMPLES

AOP C = A * B
Build the products of all contents of analyzer A and analyzer B, channel by channel, and store the result in analyzer C.

AOP A = C
Store the content of analyzer C in analyzer A.

AOP C = MAX(C,0)
Replace all negative values in analyzer C by zero.

AOPER NZ = N_PER_Z(*)
Convert isotopic distributions given by a series of one-dimensional analyzers N_PER_Z(*) into the two-dimensional analyzer NZ on a chart of the nuclides. The index of N_PER_Z(*) is the atomic number, the channel number is the neutron number.

AOPER N_PER_Z(*) = NZ
Convert the two-dimensional analyzer NZ into a series of one-dimensional analyzers N_PER_Z(*) representing isotopic distributions. The index of N_PER_Z(*) is the atomic number, the channel number is the neutron number.

AOPER AOUT = CONV(AIN,ACONV)
Convolute the analyzer AIN with the analyzer ACONV and
 write the result to the analyzer AOUT.

AOPER AOUT = CONV(AIN,5.8)
Convolute the analyzer AIN with a Gaussian function with the
 standard deviation sigma = 5.8 and write the result to the
 analyzer AOUT.