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Galaxie [™] Arithmetic Functions Plug-in

User's Guide

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Software Presentation

This document describes the Arithmetic functions Plug-in for Galaxie.

Overview

The Arithmetic functions Plug-in allows operations between either chromatograms or chromatograms and real numbers.

It operates like a calculator with two operands, one operator and one result.

Each operand can be either selected among chromatograms loaded in Galaxie or in the chromatograms storage directory. A numerical zone is also available in order to execute an operation between a chromatogram and a real number.

Different operators are available: Addition, Multiplication, Subtraction, Division, and Weighted sum.

Once the operands have been selected, the operation is validated by clicking on the operator button. The result is then displayed in the bottom left of the screen.

Installation

Insert the Galaxie CD in the CD drive.

Copy the following files in the galaxie.exe folder (by default: C:\Galaxie\client):

- AX_arithmetic.dll

- Diamirdefaultmethod.meth: It allows the user to save calculated chromatograms with this default Galaxie method

- Select the start\execute menu and type: regsvr32 C:\GALAXIE\Client\AX_ARITHMETIC.dll, to merge the file with the registry.

Start Galaxie, check that the icon allows to access the "Arithmetic functions" plug-in.

Application Details

How to Use the Arithmetic Functions Plug-in



Calc	ulated chromatograms					_ _ _×
File He	elp First operand channels	Second operand channe	ls			
9						
	Standard functions					
60			0			
Ë	First Operand			Operation	Second Operand	
0						
÷.				/V Addition		
2				<u>∧⊤ S</u> ubstraction		
3						
Ę.						
0				∧ Division		
2				<mark>Λ^Σ W</mark> eighted sum		
2	Division parameter –		pefficients -		L	
_	Ratio Threshold [%]	First operand		1		
5		3 Second operar	id	1		
E	Result			- Informations		Method to be saved
(()		Result			<u>^</u>	O Default method
<u>_</u>						C First operand method
Χ.						C Second operand method
<u>.</u>				Additional information		
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The main screen is divided into 2 parts:

The first one allows the user to select the chromatogram(s) on which the calculations (called Operand) is performed, and the type of calculation (by choosing Operation) which will define the function. Then a second part is dedicated to result viewing.

Icons allow the user to save the virtual chromatogram generated, and open it into the current Galaxie session.

Operand Selection:

The two operands are located in the top left and right of the screen. The operand can be a chromatogram or a real number.



To select Chromatograms, there are two possibilities:

- If the chromatogram is open in the Galaxie session, select its

name from the scrolling list:

- If the chromatogram is not open in the Galaxie session, select

the chromatogram via the Matton.

In the case of an operation between a real number and a chromatogram, the numerical zone next to chromatogram names must be completed. In this case, only one chromatogram and one real can be entered. The chromatogram is defined in one operand part (left or right) and the real number in the other.

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The following screen is displayed:



Operator Selection:

Once two operands (2 chromatograms or 1 chromatogram and a real) have been defined, user can select the desired operator.

Five operators are available, they are symbolized by the following pictures:

Subtraction
Multiplication
Division
Weighted Sum

As soon as the operator is selected, the result is displayed in the **Result** part of the screen:



Note that the **sampling interval and delay time** must be identical to process the calculation between chromatograms.

If the retention unit or the response unit is different between chromatograms, a warning is displayed and the user must choose if he wants to ignore the problem and process the calculation or cancel this one.

If the units are different, the unit saved in the result chromatogram is "Different unit". If the units are unknown in all the chromatogram parameters, "Unknown unit" will be saved.

NOTE: If a multi channel chromatogram is loaded into the *Arithmetic functions* Plug-in, you have to select the channel on which you want to perform calculations in the **FIRST OPERAND CHANNELS** or the **SECOND OPERAND CHANNELS** menus.

Calculation Parameters

Addition

Users can add 2 chromatogram plots, by selecting two chromatograms as operands, or can add a value to all points of the chromatogram plot. Then activating the $\wedge^* Addition$ operator.

Chromatogram and Operator Selection: Two chromatograms







Chromatogram and Operator Selection: One Chromatogram and One Operator



Result:



Subtraction

Users can subtract one chromatogram from another chromatogram plot, by selecting two chromatograms as operands, or can subtract a value to all points of the chromatogram plot. Then the subtraction is performed by activating the Λ Σ <u>Substraction</u> operator.

NOTE: In case of subtraction of two chromatograms, the second one (second operand) is subtracted from the first one (first operand).

Multiplication

Users can multiply one chromatogram by another chromatogram plot, by selecting two chromatograms as operands, or can multiply a value to all points of the chromatogram plot. Then the

multiplication is performed by activating the <u>Multiplication</u> operator.. If two chromatograms are multiplied, the signal value is multiplied point by point.

Division

Users can divide one chromatogram by another chromatogram plot, by selecting two chromatograms as operands, or can multiply a value to all points of the chromatogram plot. Then the

division is performed by activating the <u>V Division</u> ... operator.

Users have to define the ratio threshold %. The ratio chromatogram threshold determines a maximum value for ratio calculation when performing the "Division" function.

Division parameter	
Ratio Threshold [%]	
20	

When performing the A/B division, if the signal intensity of the first chromatogram (A) multiplied by the ratio chromatogram threshold (in %) and divided by 100, is superior to the signal intensity of the second chromatogram (B), then the ratio is set to 0.

For example, if the ratio threshold is set to 20%, the ratio will be set to 0 if B<0.2A

This means that the intensity of the second chromatogram represents too small of a percentage of the first chromatogram. So, the ratio chromatogram threshold sets the percentage of rejection.

Weighting Sum

This operation allows users to perform weighting addition operands, for example (2*First operand) + (3*Second operand).

In the following window, enter the first and second weighting coefficients, respectively for the first and second operand. They will be used to perform the sum.

🗆 Weighting coeffici	ents	
First operand	2,0000	
Second operand	3,0000	
-	Λ ^Σ Weighted sum	
Then activate the	opera	tor.

Chromatogram and Operator Selection: Two Chromatograms with Weighting Coefficients.



Result:



Generation of a Chromatogram Usable in Galaxie

Saving the Generated Chromatogram

The virtual chromatogram generated can be saved as a **.VIRT** file. Then, it can be processed as a normal chromatogram in Galaxie.

When the result is displayed at the bottom left part of the screen,

select the button or the FILE / SAVE RESULT menu and enter a file name.

The text displayed in the **Information** field will be automatically saved with the chromatogram. It corresponds to the description of the calculation which was processed to obtain the chromatogram. If you want to add more information, enter it in the **Additional information** field.

Informations	
Calculated chromatogram : WeigthedSum(2, analysis-5.DATA, 2, analysis-2.DATA)	4
	-
Additional information	
calculation	4
	-

The defined information will be displayed in Galaxie at the chromatogram opening, in the Open / Save file box, and in the chromatogram properties.

Loading a Virtual Chromatogram in Galaxie

After the calculation, the chromatogram displayed in the **Result** section can then be exported into Galaxie.

You can choose either to export the generated chromatogram while the Plug-in remains open:

Select the *FILE/ OPEN RESULT IN GALAXIE* menu or click on the *S* button.

or to export the generated chromatogram and close automatically the Plug-in:

Select the FILE/ GOING BACK TO GALAXIE WITH

RESULTS menu or click on the LLLL button.

In both cases, the export chromatogram default name is ArithmeticChromatogram.VIRT.

NOTE: Once an exported chromatogram is open in Galaxie, no other chromatogram can be exported from the Plug-in. The first chromatogram must first be closed.

Going Back to Galaxie Without Generating a Virtual Chromatogram

Select the **file** button, or the **file** / **CLOSE** menu to come back to Galaxie without any results.

The Plug-in is automatically closed.