VIPA spectrum analyzer - v0 Pierre Bouvet

This algorithm allows the user to recover a frequency axis basing ourselves on a single Brillouin spectrum obtained with a VIPA spectrometer. Considering that only one Brillouin Stokes and anti-Stokes doublet is visible on the spectrum, the user can select the peaks he sees, and then perform a quadratic interpolation to obtain the frequency axis. This interpolation is obtained either by entering a value for the Brillouin shift of the material or by entering the value of the Free Spectral Range (FSR) of the spectrometer. The user can finally recenter the spectrum either using the average between a Stokes and an anti-Stokes

peak or by choosing an elastic peak as zero frequency.

add point

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position).

The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic".

> position center window: 12 window_width: 5 type_pnt: Elastic

add_point

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position).

The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic".

> position center window: 37 window_width: 5 type_pnt: Anti-Stokes

add_point

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position).

The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic".

> position center window: 236 window width: 5 type_pnt: Stokes

add point

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position).

The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic".

> window width: 5 type_pnt: Elastic

position_center_window: 259

add_point

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position). The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width"

parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic". position_center_window: 282

> window_width: 5 type_pnt: Anti-Stokes

Adds a single point to the list of points together with a window to the list of windows with its type.

add_point

Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position). The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width"

parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic". position_center_window: 466

> window width: 5 type_pnt: Stokes

add_point

Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data. The point is given as a value on the x axis (not a position). The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width"

Adds a single point to the list of points together with a window to the list of windows with its type.

parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic". position_center_window: 488 window_width: 5

add_point

type_pnt: Elastic

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data.

The point is given as a value on the x axis (not a position). The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the

type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic". position center window: 509.57665803620193 window_width: 5

interpolate_elastic_inelastic

type_pnt: Anti-Stokes

frequency axis by interpolating the position of the peaks with a quadratic polynomial. The user can either

Uses the elastic peaks, and the positions of the Brillouin peaks on the different orders to obtain a

enter a value for the shift or the FSR, or both. The shift value is used to calibrate the frequency axis using known values of shifts when using a calibration sample to obtain the frequency axis. The FSR value is used to calibrate the frequency axis using a known values of FSR for the VIPA. shift: None FSR: 60

add_point

Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data.

Adds a single point to the list of points together with a window to the list of windows with its type.

The point is given as a value on the x axis (not a position). The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic".

position_center_window: 57 window width: 1 type_pnt: Stokes

add_point

Adds a single point to the list of points together with a window to the list of windows with its type. Each point is an intensity extremum obtained by fitting a quadratic polynomial to the windowed data.

The "position_center_window" parameter is the center of the window surrounding the peak. The "window_width" parameter is the width of the window surrounding the peak (full width). The "type_pnt" parameter is the type of the peak. It can be either "Stokes", "Anti-Stokes" or "Elastic". position_center_window: 68.5

The point is given as a value on the x axis (not a position).

window width: 1 type_pnt: Anti-Stokes

center_x_axis Centers the x axis using the first points stored in the class. The parameter "center_type" is used to determine wether to center the axis using the first elastic peak (center_type = "Elastic") or the average

> of two Stokes and Anti-Stokes peaks (center_type = "Inelastic"). center_type: Inelastic