mcareader Documentation

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Dih5

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Contents

Contents: A minimal python interface to read Amptek's mca files

class mcareader.**Mca**(*file*, *encoding='iso-8859-15'*, *calibration=None*)

A mca file.

raw

str – The text of the file.

calibration_points

numpy.ndarray – The 2D array with the calibration data or None if there is no such information.

__init__(*file*, *encoding='iso-8859-15'*, *calibration=None*)

Load the content of a mca file.

Parameters

- **file** (*str*) – The path to the file.
- **encoding** (*str*) – The encoding to use to read the file.
- **calibration** (*str or list*) – A path with a file used to read calibration or a 2D matrix describing it.

__weakref__

list of weak references to the object (if defined)

get_calibration_function(*method=None*)

Get a calibration function from the file.

Parameters **method** (*str*) – The method to use. Available methods include:

- 'bestfit': A linear fit in the sense of least-squares (default).
- 'interpolation': Use a linear interpolation.

Returns A function mapping channel number to energy. Note the first channel is number 0.

Return type (*Callable*)

get_calibration_points()

Get the calibration points from the MCA file, regardless of the calibration parameter used to create the object.

Returns The 2D array with the data or None if there is no calibration data.

Return type (*numpy.ndarray*)

get_counts(*calibration_method=None*, *background=None*)

Get the number of counts in the spectrum.

Parameters

- **calibration_method** (*str*) – The method used for the calibration. See *get_calibration_function*.
- **background** (*Mca*) – An spectrum describing a background to subtract from the returned points. The background is scaled using the REAL_TIME parameters.

Returns Number of counts in the spectrum.

Return type (float)

get_points(*calibration_method=None*, *trim_zeros=True*, *background=None*)

Get the points of the spectrum.

Parameters

- **calibration_method** (*str*) – The method used for the calibration. See *get_calibration_function*.
- **trim_zeros** (*bool*) – Whether to remove values with no counts.
- **background** (*Mca*) – An spectrum describing a background to subtract from the returned points. The background is scaled using the REAL_TIME parameters.

Returns

tuple containing:

x (List[float]): The list of x coordinates (mean bin energy).

y (List[float]): The list of y coordinates (counts in each bin).

Return type (tuple)

get_section(*section*)

Find the str representing a section in the MCA file.

Parameters **section** (*str*) – The name of the section to search for.

Returns The text of the section or "" if not found.

Return type (str)

get_total_energy(*calibration_method=None*, *background=None*)

Get the total energy in the spectrum.

Parameters

- **calibration_method** (*str*) – The method used for the calibration. See *get_calibration_function*.
- **background** (*Mca*) – An spectrum describing a background to subtract from the returned points. The background is scaled using the REAL_TIME parameters.

Returns Total energy of counts in the spectrum, in the units set in the calibration. If there is no calibration available, a meaningless number is returned.

Return type (float)

get_variable(*variable*)

Find the str representing a variable in the MCA file.

Parameters **variable** (*str*) – The name of the variable to search for.

Returns The text of the value or "" if not found.

Return type (str)

plot(*log_y=False*, *log_x=False*, *calibration_method=None*, *background=None*)

Show a plot of the spectrum.

Parameters

- **log_y** (*bool*) – Whether the y-axis is in logarithmic scale.
- **log_x** (*bool*) – Whether the x-axis is in logarithmic scale.
- **calibration_method** (*str*) – The method used for the calibration. See *get_calibration_function*.
- **background** (*Mca*) – An spectrum describing a background to subtract from the returned points. The background is scaled using the REAL_TIME parameters.

CHAPTER 1

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