

---

# **BMicro Documentation**

***Release 0.3.0***

**Paul Müller**

**Jun 29, 2022**



## CONTENTS:

<b>1</b>	<b>Getting started</b>	<b>3</b>
1.1	Installation . . . . .	3
1.2	Citing BMicro . . . . .	3
<b>2</b>	<b>Code reference</b>	<b>5</b>
<b>3</b>	<b>Development</b>	<b>7</b>
3.1	Development workflow . . . . .	7
3.2	Documentation . . . . .	7
3.3	Tests . . . . .	8
3.4	Making a new release . . . . .	8
3.5	Continuous integration . . . . .	8
<b>4</b>	<b>Changelog</b>	<b>9</b>
4.1	version ## 0.3.0 - 2022-06-29 . . . . .	11
4.2	version . . . . .	11
4.3	version ### Added . . . . .	11
4.4	version - Implement batch evaluation #193 . . . . .	11
4.5	version - Add option to export data #189 . . . . .	11
4.6	version - Enable calibrating all calibrations at once #192 . . . . .	11
4.7	version . . . . .	11
4.8	version ### Changed . . . . .	11
4.9	version - Bump bmlab to version 0.2.1 #190 . . . . .	11
4.10	version - Show extraction points half transparent #191 . . . . .	11
4.11	version - Code cleanup #194 . . . . .	11
4.12	version . . . . .	11
4.13	version ### Fixed . . . . .	11
4.14	version - Fix race condition in case of slow evaluation #184 . . . . .	11
4.15	version - Update preview image on new file load #196 . . . . .	11
4.16	version . . . . .	11
4.17	version ## 0.2.8 - 2022-05-13 . . . . .	11
4.18	version . . . . .	11
4.19	version ### Fixed . . . . .	11
4.20	version - Use correct bmlab version for macOS DMG packages #183 . . . . .	11
4.21	version . . . . .	11
4.22	version ## 0.2.7 - 2022-05-12 . . . . .	11
4.23	version . . . . .	11
4.24	version ### Added . . . . .	11
4.25	version - Properly handle bmlab exceptions #180 . . . . .	11
4.26	version . . . . .	11

4.27	version ### Fixed . . . . .	11
4.28	version - Don't crash when switching to multi-peak fit during evaluation #181 #182 . . . . .	11
4.29	version - Fix DMG packages for macOS by locking shapely version #179 . . . . .	11
4.30	version . . . . .	11
4.31	version ## 0.2.6 - 2022-05-06 . . . . .	11
4.32	version . . . . .	11
4.33	version ### Added . . . . .	11
4.34	version - Implement two-peak Brillouin fitting #167 #168 . . . . .	11
4.35	version - Allow to toggle aspect ratio for 2D data #171 . . . . .	11
4.36	version . . . . .	11
4.37	version ### Fixed . . . . .	11
4.38	version - Check x-limits before setting to prevent warning #172 . . . . .	11
4.39	version . . . . .	11
4.40	version ## 0.2.5 - 2022-04-25 . . . . .	11
4.41	version . . . . .	11
4.42	version ### Added . . . . .	11
4.43	version - Add calibration options dialog #162 . . . . .	11
4.44	version . . . . .	11
4.45	version ### Changed . . . . .	11
4.46	version - Show calibrations in correct temporal order #164 . . . . .	11
4.47	version - Show non-averaged fit for each calibration image #165 . . . . .	11
4.48	version . . . . .	11
4.49	version ### Fixed . . . . .	11
4.50	version - Fix small layout glitch in extraction view #161 . . . . .	11
4.51	version . . . . .	11
4.52	version ## 0.2.4 - 2022-04-12 . . . . .	11
4.53	version . . . . .	11
4.54	version ### Added . . . . .	11
4.55	version - Allow to manually set data range #159 . . . . .	11
4.56	version . . . . .	11
4.57	version ### Changed . . . . .	11
4.58	version - Make circle-fit half-transparent, show points on top #157 . . . . .	11
4.59	version . . . . .	11
4.60	version ### Fixed . . . . .	11
4.61	version - Fix opening broken/empty data sets #156 . . . . .	11
4.62	version - Fix automatic color scale for 2D data #158 . . . . .	11
4.63	version . . . . .	11
4.64	version ## 0.2.3 - 2022-04-07 . . . . .	11
4.65	version . . . . .	11
4.66	version ### Fixed . . . . .	11
4.67	version - Fix showing 2D data #154 . . . . .	11
4.68	version . . . . .	11
4.69	version ## 0.2.2 - 2022-03-22 . . . . .	11
4.70	version . . . . .	11
4.71	version ### Changed . . . . .	11
4.72	version - Code cleanup #145 . . . . .	11
4.73	version . . . . .	11
4.74	version ### Fixed . . . . .	11
4.75	version - Bring back multiprocessing support #149 . . . . .	11
4.76	version - Don't open multiple instances on Win when evaluating #147 . . . . .	11
4.77	version - Don't open multiple instances on MacOS with DMG package #140 . . . . .	11
4.78	version . . . . .	11
4.79	version ## 0.2.1 - 2022-03-21 . . . . .	11
4.80	version . . . . .	11

4.81	version ### Changed . . . . .	11
4.82	version - Code cleanup #135 #142 . . . . .	11
4.83	version . . . . .	11
4.84	version ### Fixed . . . . .	11
4.85	version - Don't crash when extracted peaks are on a straight line #141 . . . . .	11
4.86	version - Don't crash when trying to evaluate #139 . . . . .	11
4.87	version . . . . .	11
4.88	version ## 0.2.0 - 2022-03-15 . . . . .	11
4.89	version . . . . .	11
4.90	version ### Added . . . . .	11
4.91	version - Implement showing 3D data #128 . . . . .	11
4.92	version - Remember last used folder #132 . . . . .	11
4.93	version . . . . .	11
4.94	version ### Fixed . . . . .	11
4.95	version - Fix warning when file could not be opened #129 . . . . .	11
4.96	version - Fix build #131 . . . . .	11
4.97	version . . . . .	11
4.98	version ## 0.1.6 - 2022-02-18 . . . . .	11
4.99	version . . . . .	11
4.100	version ### Added . . . . .	11
4.101	version - Add an about menu #119 . . . . .	11
4.102	version . . . . .	11
4.103	version ### Changed . . . . .	11
4.104	version - Update to PyQt6 to support M1 Macs #124 . . . . .	11
4.105	version . . . . .	11
4.106	version ### Fixed . . . . .	11
4.107	version - Request minimum required bmlab version #122 . . . . .	11
4.108	version - Pin Shapely to 1.8.0 #120 #121 . . . . .	11
4.109	version . . . . .	11
4.110	version ## 0.1.5 - 2022-02-16 . . . . .	11
4.111	version . . . . .	11
4.112	version ### Fixed . . . . .	11
4.113	version - Adjust release pipeline to properly build and upload release artifacts #118 9347bce74f7bf1fb40ab823967f4be8490af47b9 eb5d7e7d2bcb4cf590e967a01a71d00aefced3b5 . . .	11
4.114	version . . . . .	11
4.115	version ## 0.1.4 - 2022-02-16 . . . . .	11
4.116	version . . . . .	11
4.117	version ### Added . . . . .	11
4.118	version - Add keyboard shortcuts for file actions #117 . . . . .	11
4.119	version - Allow finding peaks in extraction view for all calibrations #111 . . . . .	11
4.120	version - Implement automatic peak finding in calibration view #110 . . . . .	11
4.121	version - Implement automatically finding peaks #99 . . . . .	11
4.122	version - Allow to browse through calibration spectra #89 . . . . .	11
4.123	version - Show selected extraction points in table, allow editing #85 . . . . .	11
4.124	version - Show colorbar with labels in evaluation view #70 . . . . .	11
4.125	version - Automatically load session if it exists #67 . . . . .	11
4.126	version . . . . .	11
4.127	version ### Changed . . . . .	11
4.128	version - Add action to exit app #107 . . . . .	11
4.129	version - Deploy with python-3.9 #105 . . . . .	11
4.130	version - Update pyinstaller version #104 . . . . .	11
4.131	version - Require python >= 3.7 #103 . . . . .	11
4.132	version - Add more package requirements #98 . . . . .	11
4.133	version - Suppress mean of empty slice warning #95 . . . . .	11

4.134	version - Suppress useless warning #88	11
4.135	version - Automatically set image shape on orientation change #84	11
4.136	version - Adjust to streamlined bmlab interface #83	11
4.137	version - Adjust to changes in bmlab #82	11
4.138	version - Refactor use of session #81	11
4.139	version - Only check bmlab main branch in workflows #72	11
4.140	version	11
4.141	version ### Fixed	11
4.142	version - Fix rotation labels and make rotations more generic #114	11
4.143	version - Fix matplotlib deprecation warnings #115	11
4.144	version - Fix build on appveyor and for MacOS #116	11
4.145	version - Correctly show evaluation plot after closing a file #102	11
4.146	version - Fix crash when clicking if no file is loaded #101	11
4.147	version - Try to fix slow evaluation plot update #97	11
4.148	version - Recalculate derived values when calibration changes #90	11
4.149	version - Correctly scale the data if the unit is GHz #77	11
4.150	version - Only update necessary tab when switching tabs #76	11
4.151	version - Show measurement of arbitrary dimensionality correctly #74	11
4.152	version - Actually run pytest in checks #73	11
4.153	version	11
4.154	version ## 0.1.3	11
4.155	version	11
4.156	version - setup: use “pytest” command instead of deprecated “setup.py test”	11
4.157	version - ui: add app icon (#9)	11
4.158	version - ui: data tab (#11)	11
4.159	version - build: add Windows and macOS build pipeline (#1)	11
4.160	version	11
4.161	version ## 0.1.2	11
4.162	version	11
4.163	version - CI automation	11
4.164	version	11
4.165	version ## 0.1.1	11
4.166	version	11
4.167	version - Test CI automation	11
4.168	version	11
4.169	version ## 0.1.0	11
4.170	version	11
4.171	version - dummy release	11
<b>5</b>	<b>Bibliography</b>	<b>13</b>
<b>6</b>	<b>Indices and tables</b>	<b>15</b>

This is BMicro, a graphical user interface for Brillouin microscopy data evaluation. This is the documentation of bmlab version 0.3.0.





## GETTING STARTED

### 1.1 Installation

To install BMicro, use one of the following methods:

- **from PyPI:** `pip install bmicro`
- **from sources:** `pip install .`

### 1.2 Citing BMicro

If you use BMicro in a scientific publication, please cite it with:

BMicro developers (2022), BMicro version X.X.X: Python library for the post-measurement analysis of Brillouin microscopy data sets [Software]. Available at <https://github.com/BrillouinMicroscopy/BMicro>.



## CODE REFERENCE

TODO



## DEVELOPMENT

This section gives an overview about everything you need to know if you wish to contribute to [bmlab](#) or [BMicro](#).

### 3.1 Development workflow

We use [GitHub projects](#) to manage the development workflow of [bmlab](#) and [BMicro](#). The main development project board is [Brillouin Evaluation in Python](#).

The development is split into “User Stories”, each of which is a collection of issues (identified via titles in the issues). The current work in progress (WIP) branch is named according to the currently active user story (e.g. *1-smoke-test*). Issues that are not part of the current user story should still be addressed in the current WIP branch.

Once you wish to address an issue, drag it from the “Open” or “Ready” column of the project board to the “In progress” column. Once you finished working on an issue, drag it to the “Done” column, but don’t close it yet (It should be discussed first in the dev meeting).

#### Notes:

- Please write test functions and keep code coverage above 90%.
- Please make sure to always edit the changelog for [BMicro](#) or [bmlab](#).
- Please try to always pull with rebase

```
git pull --rebase
```

instead of

```
git pull
```

to prevent confusions in the commit history.

### 3.2 Documentation

It is always helpful to have code examples and thorough descriptions in a documentation. We use [sphinx-autodoc](#) for the [code reference](#), which means that the docstrings of your functions and classes are automatically rendered. Please make sure that this is working properly - go to the docs directory and execute:

```
pip install -r requirements.txt
sphinx-build . _build
```

This will create a file `_build/index.html` which you can open in your favorite browser. This also applies to [bmlab](#).

## 3.3 Tests

We try to adhere to test-driven development. Please always write test functions for your code. Make sure you have the required packages installed:

```
pip install -r tests/requirements.txt
```

You can run all tests via

```
python -m pytest tests
```

To check for code coverage, make sure the *coverage* Python package is installed and run

```
coverage run --source="bmicro" -m pytest tests
coverage report
```

## 3.4 Making a new release

The release process of BMicro is completely automated. All you need to know is that you have to create an incremental tag:

```
git tag -a "0.1.3"
# or (if you have set up GPG)
git tag -s "0.1.3"
# and finally
git push --tags
```

For more information on how automatic deployment to PyPI works, please read on.

## 3.5 Continuous integration

The following things are automated:

- pytest and flake8 on Linux, macOS, and Windows via GitHub Actions: <https://github.com/BrillouinMicroscopy/BMicro/actions?query=workflow%3AChecks>

You should always check that all checks pass before you merge a pull request (A green state on your local machine does not mean a global green state).

- automatic deployment to PyPI on tag creation via GitHub Actions: <https://github.com/BrillouinMicroscopy/BMicro/actions?query=workflow%3A%22Release+to+PyPI%22>

Paul Müller created the BMicro package on PyPI and gave the user `ci_bm` permission to upload new releases. The password for this user is an [organization secret](#).

- documentation is built automatically (for all tags and for the latest commit to the main branch) on readthedocs: <https://readthedocs.org/projects/BMicro/builds/>
- coverage statistics are done with codecov: <https://codecov.io/gh/BrillouinMicroscopy/BMicro>

Please try stay above 90% coverage.

Badges for all of these CI tasks are in the main `README.rst` file.

## CHANGELOG

List of changes in-between bmlab releases.





**4.1 version ## 0.3.0 - 2022-06-29**

**4.2 version**

**4.3 version ### Added**

**4.4 version - Implement batch evaluation #193**

**4.5 version - Add option to export data #189**

**4.6 version - Enable calibrating all calibrations at once #192**

**4.7 version**

**4.8 version ### Changed**

**4.9 version - Bump bmlab to version 0.2.1 #190**

**4.10 version - Show extraction points half transparent #191**

**4.11 version - Code cleanup #194**

**4.12 version**

**4.13 version ### Fixed**

**4.14 version - Fix race condition in case of slow evaluation #184**

**4.15 version - Update preview image on new file load #196**

**4.16 version**

**4.17 version ## 0.2.8 - 2022-05-13**

**4.18 version**

**4.19 version ### Fixed**

**4.20 version - Use correct bmlab version for macOS DMG packages**

**4.1. version ## 0.3.0 - 2022-06-29**

**4.21 version**



**BILBLIOGRAPHY**



## INDICES AND TABLES

- `genindex`
- `modindex`
- `search`