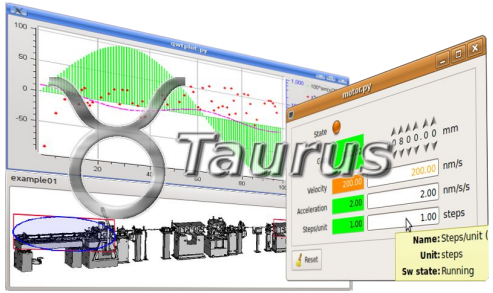
Taurus Status

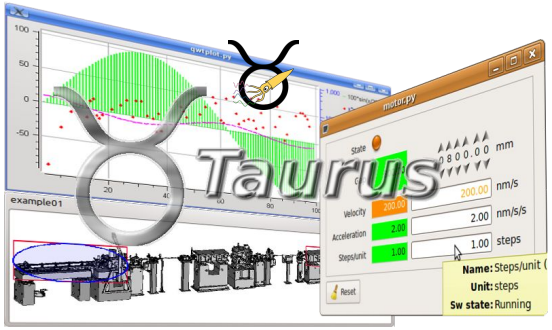


40th Tango Community meeting

8-10 June 2026, ALBA Synchrotron, Barcelona, Spain

Arturo Hoffstadt (ESO)
Benjamin Bertrand (MAXIV)
Raphaël Girardot, Patrick Madela (SOLEIL)
Natxo Vergara (ESRF)
Oriol Vallcorba, Emilio Morales, Jose Ramos, Jairo Moldes, Sergi Rubio, Zbigniew Reszela (ALBA)

on behalf of the Taurus Community



Based on

PyQt/PySide pyqtgraph

Python framework

Provides a structured approach for building **Graphical User Interfaces** (GUIs) and interacting with underlying control systems (e.g. TANGO)

Modular and extensible with plugins and widgets.

Zero-code solutions. Designer. Programmatic development. Draggable attributes between apps. Synoptics.

ALBA

ESO

MAX IV LABORATORY

DESY.

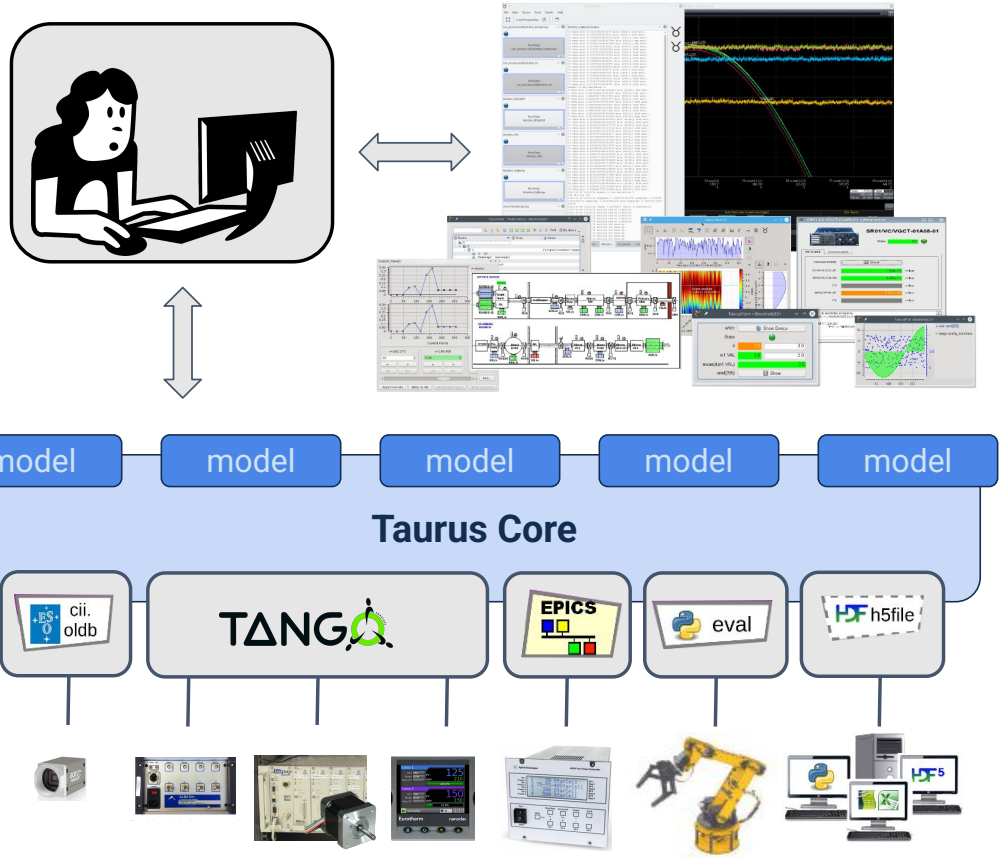
SOLARIS NATIONAL SYNCHROTRON RADIATION CENTRE

ESRF The European Synchrotron

SOLEIL SYNCHROTRON

Community-driven. Open Source (LGPL v3). @ALBA more than 10y of operation with Taurus. Extensively used.

A model-driven abstraction layer for control systems



Taurus GUIs

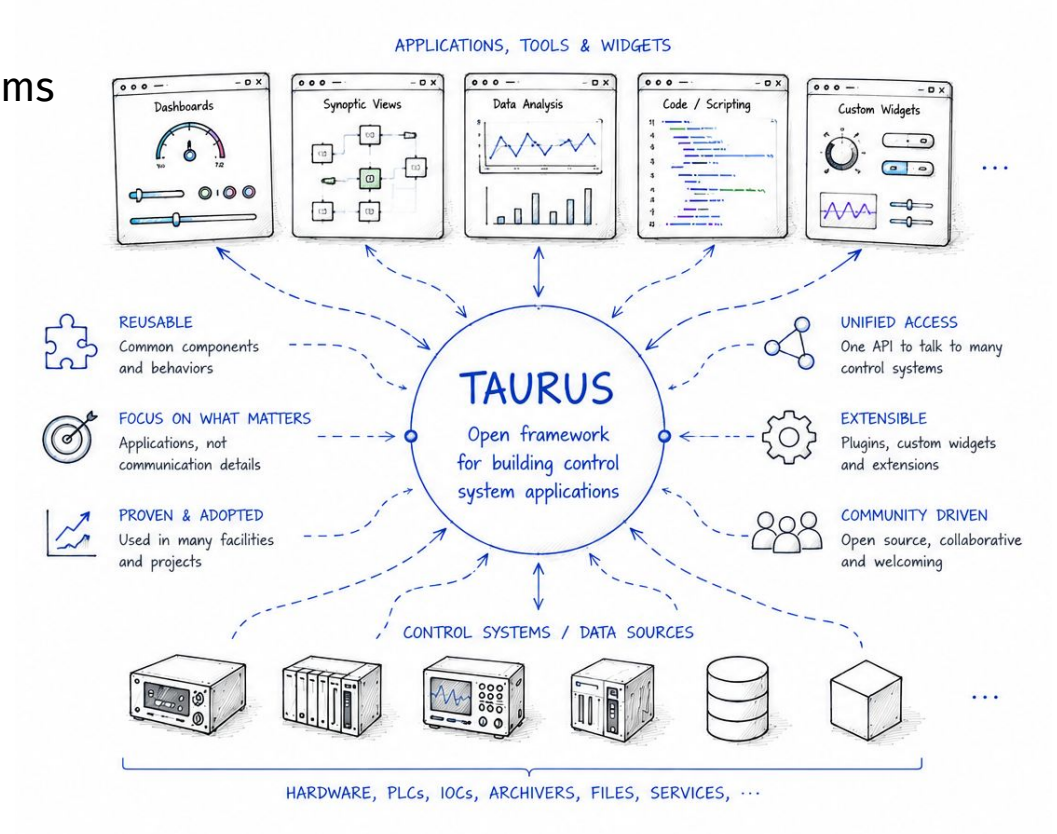
Taurus Qt Widgets

Everything is a model!

Taurus Model Objects
(e.g. Attribute, Device,...)

Taurus Schemes

- Unified API for different control systems
- Model-centric architecture
- Event-driven data access
- Plugin-based extensibility
- Same widget → different backend
- Simplified application development



🚀 Last release: **Taurus 5.4** (March 18th, 2026)

- ✓ Taurus Performance Optimization (event subscription modes)
- ✓ Migration of `guiqwt` to `plotpy`
- ✓ Qt6 support (Taurus 5.3)
- ✓ Support for Tango device state colors, and ready to support other color policies (Taurus 5.3). Added support for custom colors in `TaurusLed`

✓ Taurus Performance Optimization

- Improve Taurus startup time, scalability and responsivenes
- Since Taurus 5.2
- Taurus 5.4 is compatible with new Tango 10.1 Event Subscription Modes
  - in <10.1 subscribe_event() in the Tango DeviceProxy causes always a synchronous read that can slow down the application startup by up to 3 seconds per attribute (e.g. slow attrs or if the attr raises a timeout)
  - >10.1 subscription modes: Sync, SyncRead, ASync, ASyncRead

✓ Taurus Performance Optimization

EventSubMode	Tries subscription before returning	Raises on subscription failure	Reads entity	First callback
SyncRead	Yes	Yes	Yes, during subscription	Immediately, with data
AsyncRead	No	No	Yes, after subscription	After read, with data
Sync	Yes	Yes	No	Only on next event
Async	No	No	No	After subscription, no data
Stateless	Yes	No	Yes, during subscription	Immediately, with data

from PyTango documentation

Support all Tango Event Subscription modes.

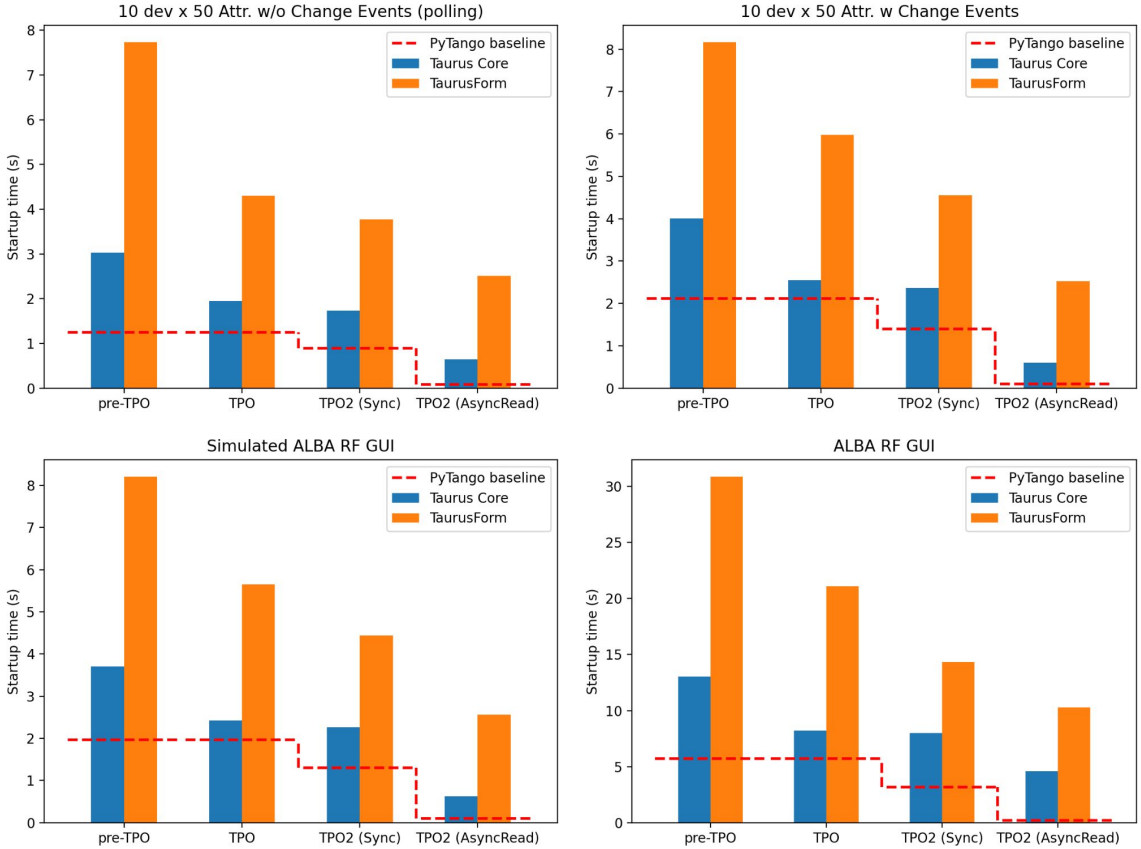
- Selectable via custom settings, CLI or code (default AsyncRead)
- First read thread on modes without initial read.
- Manage subscription success/failure according to EventReason in first callback

✓ Taurus Performance Optimization

Startup time comparison for Taurus Core (no PyQt layer) and TaurusForm (four Taurus Qt widgets per attribute) before optimisation (pre-TPO) and after TPO/TPO2 (Sync+Taurus first read and AsyncRead).

ALBA Radio Frequency GUI with 496 attributes with events, 81 without, and 7 raising exceptions

PyTango baseline = `DeviceProxy` creation plus subscription to configuration and change events.



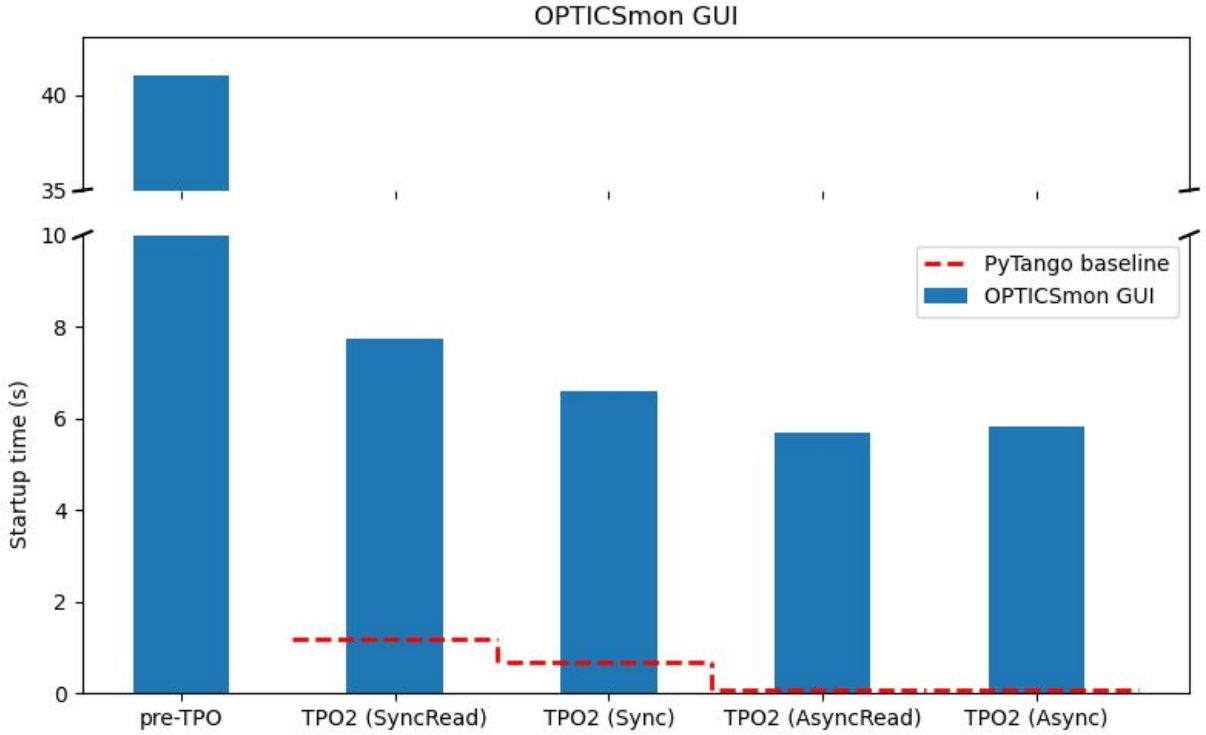
Startup times reduced by up to 70%

✓ Taurus Performance Optimization

BL04 OpticsMon
164 Models: 141 Events, 22 Polling

✓ Taurus Performance Optimization

BL04 OpticsMon
164 Models: 141 Events, 22 Polling



pre-TPO -> AsyncRead
41.0 s -> 5.69 s
86.1% reduction

SyncRead -> AsyncRead
7.72 s → 5.69 s
26.3% reduction

PyTango baseline = `DeviceProxy` creation plus subscription to configuration and change events.

✓ Taurus Performance Optimization

- Possible next steps:
  - Optimize addition of (lots of) attributes after application has started
  - Investigate causes of big differences pytango - taurus core in some cases
  - Fix bugs that will appear now that is released. Tune the different modes that may be adapted to different use cases.
  - Take profit of new Python features (free threading, multiprocessing)
  - Document best practices when creating GUIs to optimize startup times.

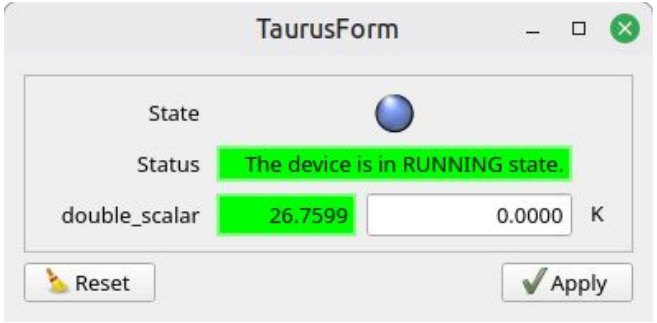
✓ **Support for Tango device state colors** (+ flexible color policies)

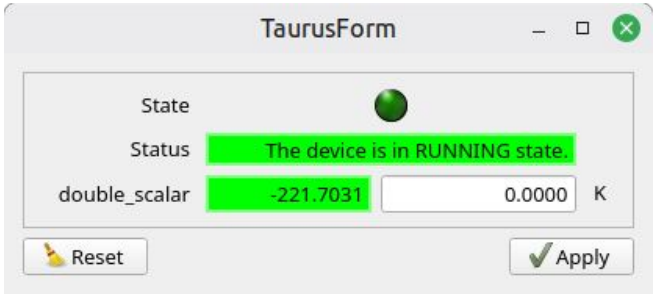
For historical reasons Taurus color convention differ slightly from Tango colors.

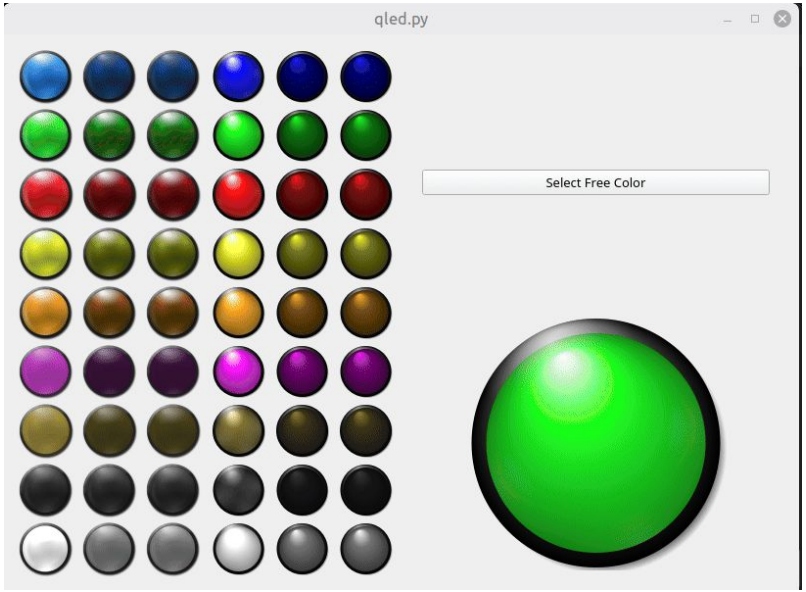
State	bg	fg	Taurus Color	bg	fg	ATK Color
On	Lime (0,255,0)	Black (0,0,0)	On	Lime (0,255,0)	Black (0,0,0)	On
Off	White (255,255,255)	Black (0,0,0)	Off	White (255,255,255)	Black (0,0,0)	Off
Close	White (255,255,255)	Green (0,128,0)	Close	White (255,255,255)	Green (0,128,0)	Close
Open	Lime (0,255,0)	Black (0,0,0)	Open	Lime (0,255,0)	Black (0,0,0)	Open
Insert	White (255,255,255)	Black (0,0,0)	Insert	White (255,255,255)	Black (0,0,0)	Insert
Extract	Lime (0,255,0)	Black (0,0,0)	Extract	Lime (0,255,0)	Black (0,0,0)	Extract
Moving	Taurus - Cornflower Blue (128,160,255)	Black (0,0,0)	Moving	Light blue (128,160,255)	Black (0,0,0)	Moving
Standby	Yellow (255,255,0)	Black (0,0,0)	Standby	Yellow (255,255,0)	Black (0,0,0)	Standby
Fault	Red (255,0,0)	Black (0,0,0)	Fault	Red (255,0,0)	White (255,255,255)	Fault
Init	Taurus - Dark Khaki (204,204,122)	Black (0,0,0)	Init	beige (204,204,122)	Black (0,0,0)	Init
Running	Taurus - Cornflower Blue (128,160,255)	Black (0,0,0)	Running	Dark green (0,125,0)	White (255,255,255)	Running
Alarm	Dark Orange (255,140,0)	White (255,255,255)	Alarm	Dark Orange (255,140,0)	White (255,255,255)	Alarm
Disable	Magenta (255,0,255)	Black (0,0,0)	Disable	Magenta (255,0,255)	White (255,255,255)	Disable
Unknown	Gray (128,128,128)	Black (0,0,0)	Unknown	Gray (155,155,155)	White (255,255,255)	Unknown

✓ **Support for Tango device state colors** (+ flexible color policies)

```
[taurus]
TANGO_DEVICE_STATE_COLOR_POLICY="tango"
```







Allow color-blindness friendly color policies

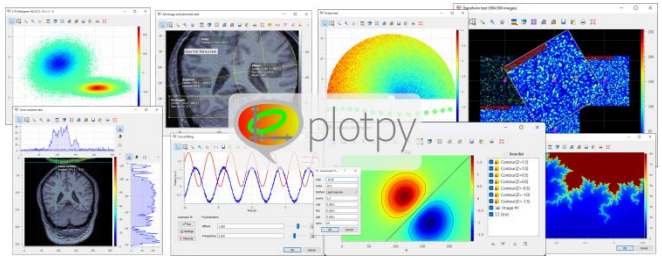
WiP to make addition of color policies easy an plugin style

✓ **Support for Tango device state colors** (+ flexible color policies)

Colors for Taurus Attribute quality

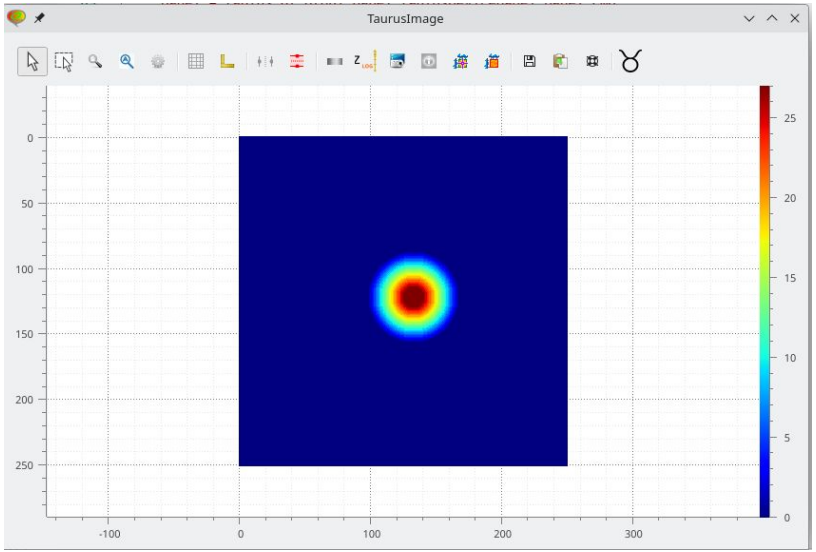
Quality	Background	Foreground	Preview
Invalid	Gray (128,128,128)	White (255,255,255)	-----
Valid	Lime (0,255,0)	Black (0,0,0)	10.89 mV
Alarm	Dark Orange (255,140,0)	White (255,255,255)	76.54 mV
Warning	Dark Orange (255,140,0)	White (255,255,255)	64.23 mV
Changing	Taurus - Cornflower Blue (128,160,255)	Black (0,0,0)	20.45 mV

🎯 2D plotting plugins

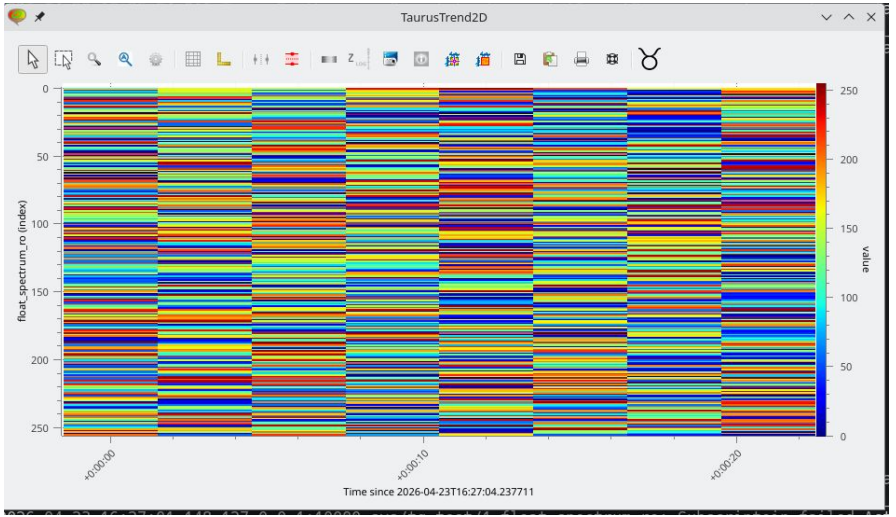


✓ Migration of `guiqwt` to `plotpy`

`TaurusImage`

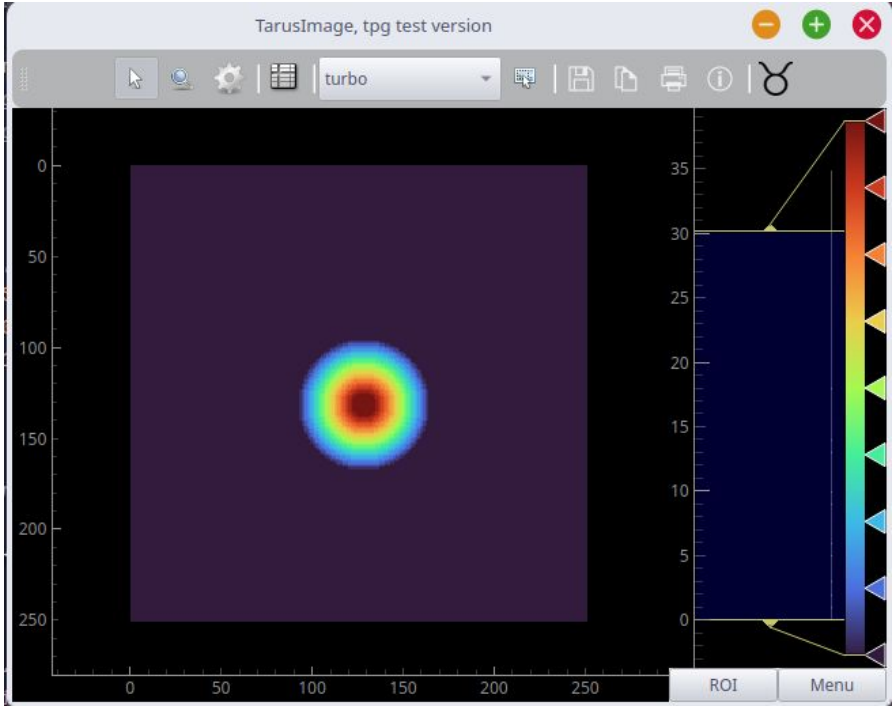


`TaurusTrend2D`



🎯 2D plotting plugins

WiP add alternative to taurus-pyqtgraph (unify plot catalog)



Freezes in flyscan GUI @ SOLEIL

- Investigating the issue. Workaround found by disabling event subscription
- Device is creating/destroying dynamically attributes with same names and GUI is creating/destroying dynamically widgets for these attributes
- Need to be properly debugged if it comes from Taurus/Qt/Tango (may need help from Tango core if it is the latter case)

Taurus workshop @ SOLEIL SYNCHROTRON 12-13 May, 2026

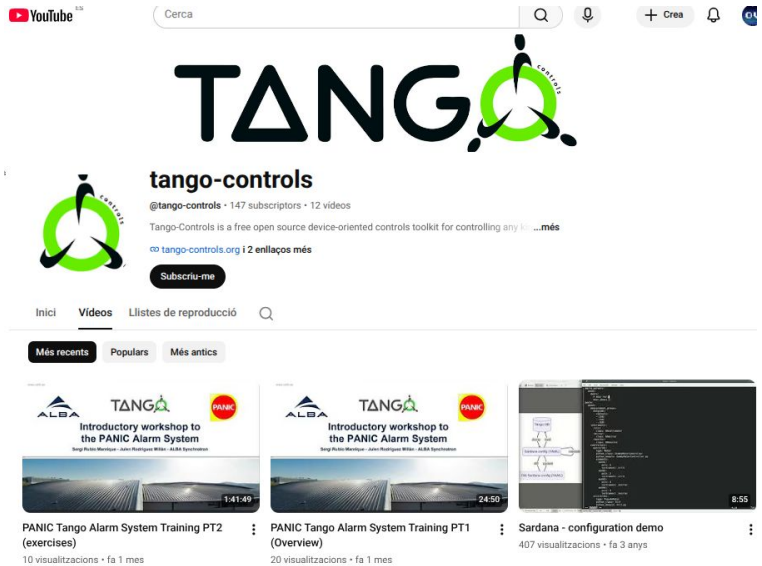
- 1st day focused on **using** Taurus and included introductory session, recent features and developments and user feedback and Use cases.
- 2n day focused on **developing** taurus with a hands-on in small developments / bug squashing format.

https://indico.synchrotron-soleil.fr/event/166

~30 participants on-site + remote (30-40)
~14 different affiliations

Taurus workshop @ SOLEIL SYNCHROTRON 12-13 May, 2026

- Use of taurus, needs and resources from the different facilities. Foster collaboration and share responsibilities among the collaborating facilities to the project.
- Improve the training materials and documentation. Share remote training sessions between facilities.
- Features (colors, synoptics, optimizations, platform and qt compatibility, plotting improvements, compatibility with polling buffers, ...)



Add training materials and workshop recordings to Tango YouTube channel

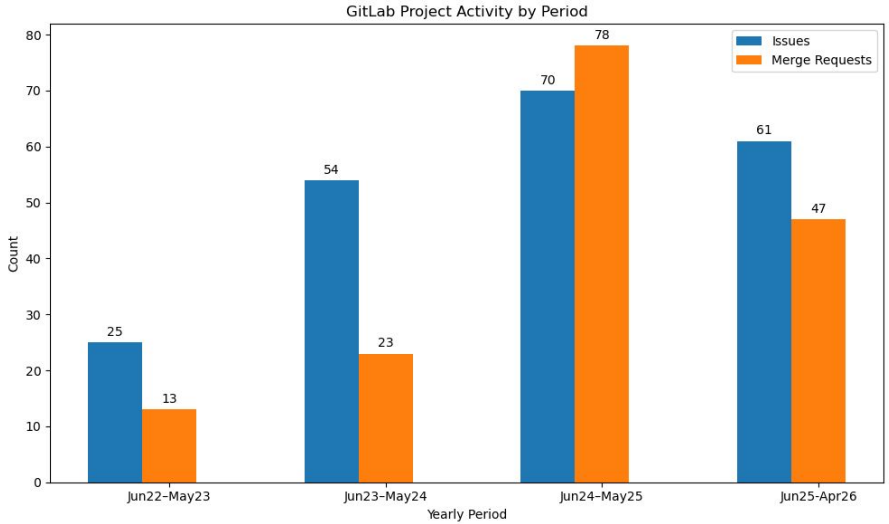
Taurus Project

Monthly follow-ups with community

- Agenda and Minutes: https://gitlab.com/taurus-org/taurus-followup
- Advertised via tango-controls indico, taurus mailing lists and mattermost

Community worshops/trainings

- SOLEIL 2023 & 2026. Participants (~60) from >10 different affiliations
- ALBA 2025. Participants (~8) from ALBA, ESRF, Soleil



Current open Issues: 271
Current open MRs: 10

Taurus community resources

- Taurus documentation: https://taurus-scada.org/
- Taurus repository: https://gitlab.com/taurus-org/taurus
  wiki also contains useful links: https://gitlab.com/taurus-org/taurus/-/wikis/Home
- Taurus PyQtGraph: https://gitlab.com/taurus-org/taurus_pyqtgraph
- Taurus trainings: https://gitlab.com/taurus-org/taurus-training
- Taurus mailing lists
- Monthly follow-up meetings with the community.
  - Meeting minutes: https://gitlab.com/taurus-org/taurus-followup
- Taurus Mattermost channel in Tango-Controls

Acknowledgements

ALBA: Emilio Morales, Jose Ramos, Sergi Rubio, Jairo Moldes, Miquel Navarro*, Carlos Pascual*, Zbigniew Reszela, *et.al.*

Big thanks to all contributors (issues, MRs, commits in last 2y, alphabetical order)

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Thank you for your attention!