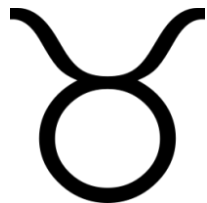# Taurus Status

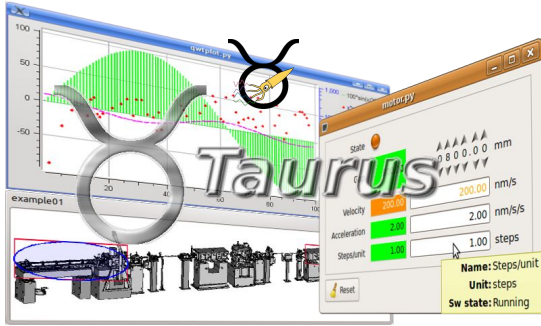39th Tango Community meeting

21-23 May 2025, INAF, Giulianova, Italy

Arturo Hoffstadt (ESO)
Benjamin Bertrand (MAXIV)
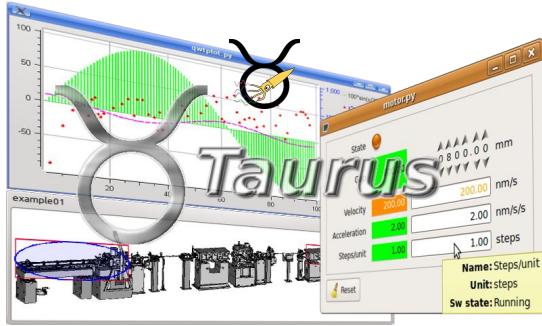Oriol Vallcorba, Emilio Morales, Jose Ramos, Jairo Moldes, Miquel Navarro, Sergi Rubio, Zbigniew Reszela (ALBA)

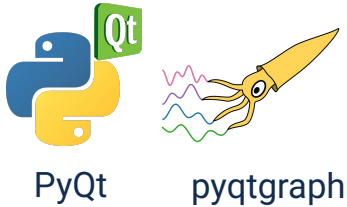*on behalf of the* Taurus Community

Python framework

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

Based on

PyQt   pyqtgraph

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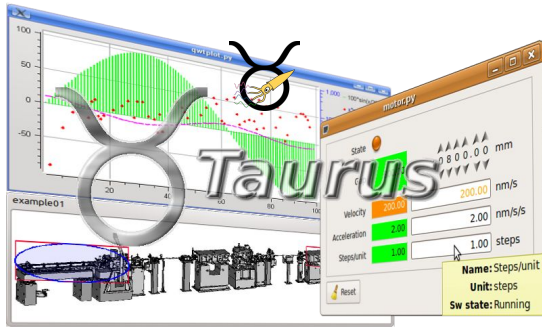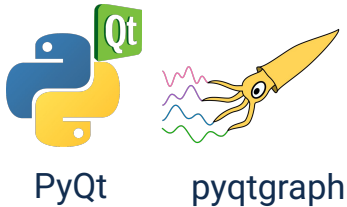
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Based on

PyQt   pyqtgraph

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

🚀 **Taurus stable version 5.2 released on 25th Oct 2024**
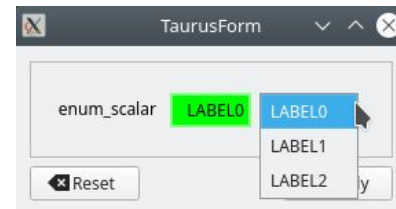
Additions reported in last Tango meetings as WiP:

✓　　Support for multiple tangoDB

✓　　Correction of memory leaks when attributes were raising exceptions

✓　　Plotting enhancements (inspector, ranges, curve names, statistics)

✓　　Taurus Performance Optimization (v1) <- we'll come back to this

Next stable version 5.3 scheduled for July 2025

🚀 **Taurus stable version 5.2 released on 25th Oct 2024**

Other relevant additions in 5.2.x:

✓ More flexible Tango event subscription

 • API methods to disable event subscription (and use only polling)

 • Allow selection of events to subscribe (not only CHANGE_EVENTS)

✓ Support for Tango DevEnum

✓ API method to add Tango State as bgRole option

✓ Support for NumPy 2.0

Taurus Performance Optimization (TPO)

TEP21 – Taurus startup and polling performance optimization (started on 2023)

- **Aims to improve Taurus startup time, scalability and responsivenes**

  - Core optimization

  - Improve polling

  - Use of **profiling tools** (e.g. cProfile, snakeviz, tuna) to identify bottlenecks

  - Creation of **comprehensive benchmark tests** to avoid regressions.

- **Taurus 5.2** already includes TPO (v1.0)

Taurus Performance Optimization (TPO)

	Attr events 500	Attr w/o events 0	Attr events 0	Attr w/o events 500
	pre-TPO	TPO	pre-TPO	TPO
Tango Startup time [s]	2.3		1.4	
TaurusCore Startup Time [s]	5.2	3.5 *1.5x*	4.2	2.5 *1.7x*
TaurusLabel Startup Time [s]	5.3	4.1 *1.3x*	3.8	2.1 *1.8x*
TaurusForm Startup Time [s]	14.3	11.3 *1.3x*	11.7	6.2 *1.9x*
		~25% time reduction		*~43% time reduction*

Taurus Performance Optimization (TPO)

	Attr events 496 (7)	Attr w/o events 81		Attr events 500	Attr w/o events 0		Attr events 0	Attr w/o events 500	
	pre-TPO	TPO		pre-TPO	TPO		pre-TPO	TPO	
Tango Startup time [s]	2,6			2.3			1.4		
TaurusCore Startup Time [s]	5.8	3.8	*1.5x*	5.2	3.5	*1.5x*	4.2	2.5	*1.7x*
TaurusLabel Startup Time [s]	5.9	4,3	*1.4x*	5.3	4.1	*1.3x*	3.8	2.1	*1.8x*
TaurusForm Startup Time [s]	16.2	12.0	*1.4x*	14.3	11.3	*1.3x*	11.7	6.2	*1.9x*
	~29% time reduction			*~25% time reduction*			*~43% time reduction*		

Taurus Performance Optimization (TPO)

	Attr events Attr w/o events 496 (7) 81		Attr events Attr w/o events 500 0		Attr events Attr w/o events 0 500	
	pre-TPO	TPO	pre-TPO	TPO	pre-TPO	TPO
Tango Startup time [s]	2,6		2.3		1.4	
TaurusCore Startup Time [s]	5.8	3.8 *1.5x*	5.2	3.5 *1.5x*	4.2	2.5 *1.7x*
TaurusLabel Startup Time [s]	5.9	4,3 *1.4x*	5.3	4.1 *1.3x*	3.8	2.1 *1.8x*
TaurusForm Startup Time [s]	16.2	12.0 *1.4x*	14.3	11.3 *1.3x*	11.7	6.2 *1.9x*
	~29% time reduction		*~25% time reduction*		*~43% time reduction*	

Real ALBA RF GUI *Real ALBA PCGrid SRMain GUI*

	Attr events Attr w/o events 496 (7) 81		Attr events Attr w/o events 488 2	
Tango Startup time [s]	5,7		5.1	
TaurusCore Startup Time [s]	14,3	8,9 *1.6x*	10.2	6.6 *1.5x*
TaurusLabel Startup Time [s]	16,4	8,9 *1.8x*	11.4	7.9 *1.4x*
TaurusFrom Startup Time [s]	28,7	17,6 *1.6x*	22.6	17.9 *1.3x*
	~40% time reduction		*~29% time reduction*	

✓ in 5.2!

🎯 TPO 2.0 - Attributes with events

- subscribe_event() in the Tango DeviceProxy causes 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)

- **New Tango feature** (targeted for 10.1)**. Event Subscription Modes**

  - https://gitlab.com/tango-controls/cppTango/-/issues/1344

  - https://gitlab.com/tango-controls/cppTango/-/merge_requests/1395

  - Modes: Sync, SyncRead, ASync, ASyncRead

  - **Still in review and testing**

thanks Thomas Braun!

( ) byte physics

🎯 TPO 2.0 - Attributes with events

AsyncRead

	Attr events 496 (7)	Attr w/o events 81		Attr events 500	Attr w/o events 0		Attr events 0	Attr w/o events 500
	pre-TPO	TPO	**TPO2**	pre-TPO	TPO	**TPO2**	pre-TPO	TPO	**TPO2**
Tango Startup t [s]	2,6			2.3			1.4		
TaurusCore Startup t [s]	5.8	3.8	**1.1**	5.2	3.5	**1.0**	4.2	2.5	**1.1**
TaurusLabel Startup t [s]	5.9	4,3	**1.4**	5.3	4.1	**1.3**	3.8	2.1	**1.4**
TaurusForm Startup t [s]	16.2	12.0	**6.2**	14.3	11.3	**5.8**	11.7	6.2	**4.9**

- AsyncRead tested. GUI startup time (user experience) improves, but not clear still how to deal with some issues (serialization, unknown subscribe status, race conditions...).
- Pending to implement a Sync (no read) + Taurus read.

https://drive.google.com/file/d/1GzAv7qbh1V7bMS5sOiNSuDzfs1NnEYbs/view?usp=sharing

https://drive.google.com/file/d/1On1xHzZto8zJVmf84tOzcUNb8Mei4bSp/view?usp=sharing

https://drive.google.com/file/d/1JwyvOZSiZvYBghDaODocnffTzmuEHqI4/view?usp=sharing

🎯 **Current developments**

- Targeted for **5.3** release (Jul25):

  🧐 Qt6 compatibility (PyQt6/PySide6) - !1300 (in review)   thanks Arturo!

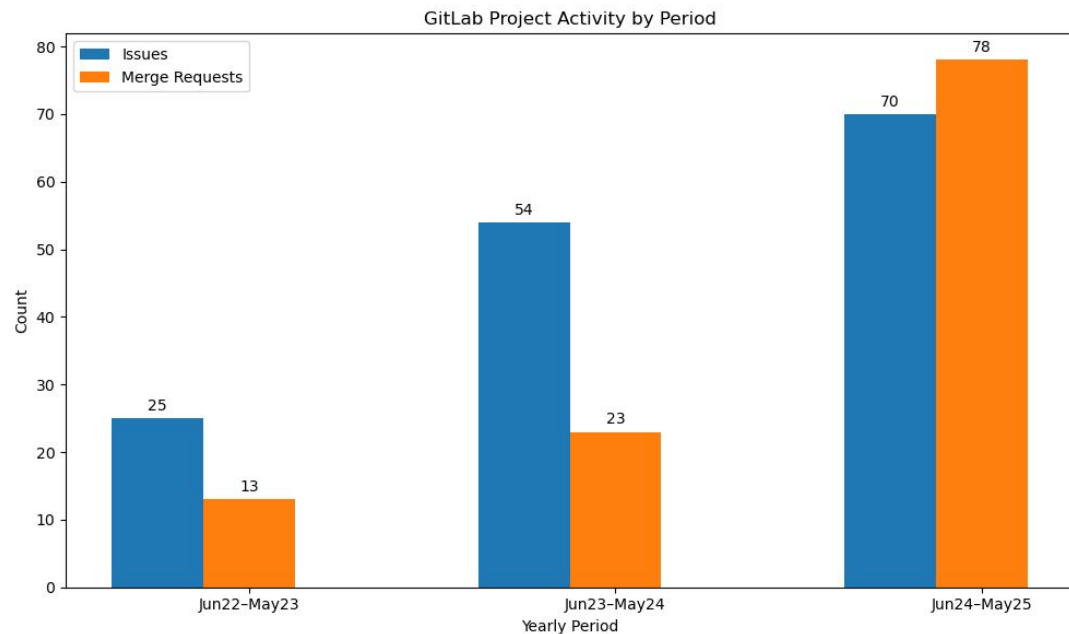 🛠 TEP21 (TPO) 2.0 - !1358

🛠 Issues with Qt Designer and custom Taurus widgets in conda

🛠 General stability and bug fixes (address open issues)

📐 guiqwt has been replaced by PlotPy

Follow-up from last Tango Metting

Concerns about the project's health and the revival of the Taurus community following the departure of the main maintainer.

Current open Issues: 262
Current open MRs: 12

Monthly follow-ups with community

- Agenda and Minutes:
  https://gitlab.com/taurus-org/taurus-followup

- Advertised in tango and taurus mailing lists

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

Thank you for your attention!