

Swift-XRT GRB lightcurves in Astro-COLIBRI

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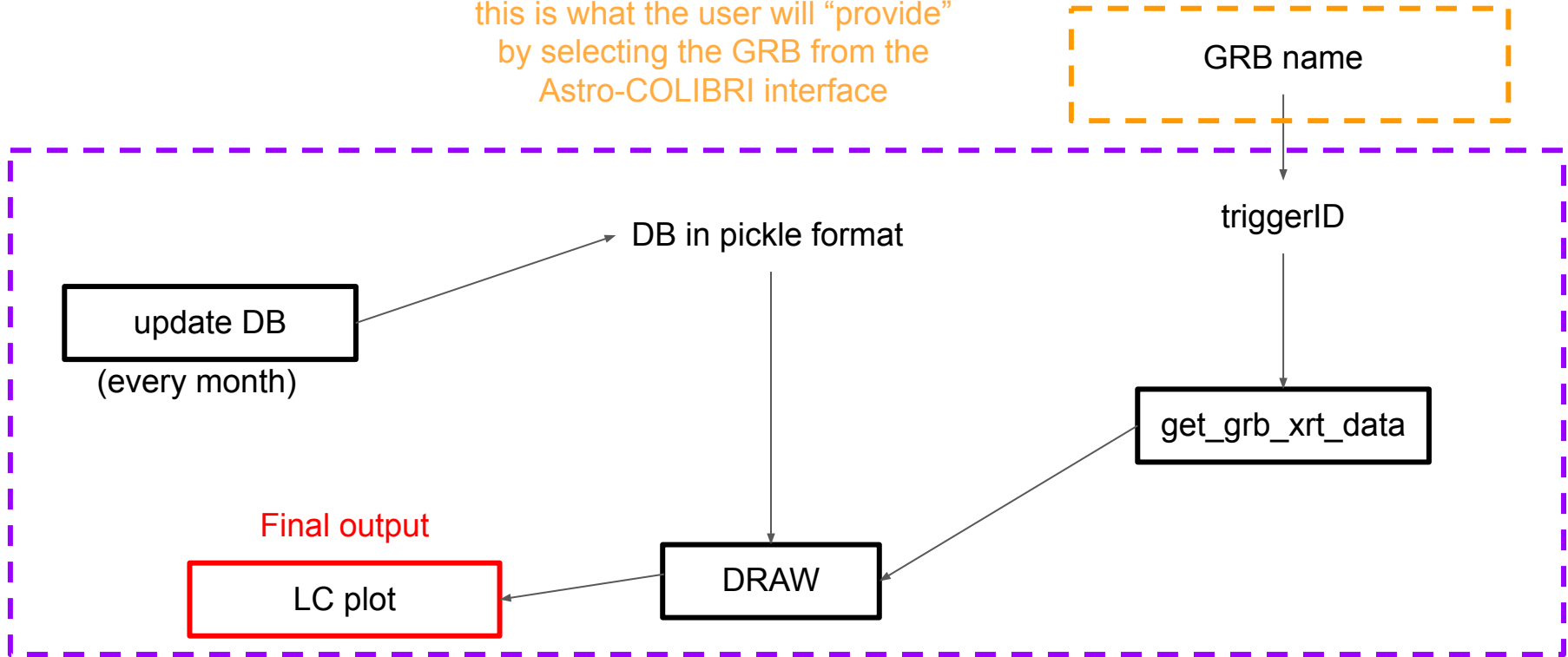


The idea

- For GRBs detected by Swift-XRT, it would be nice to have a plot showing the GRB lightcurve of the afterglow
- This can be shown together with the LCs from all the other GRBs detected by Swift, for a fast visual comparison

The concept

this is what the user will “provide”
by selecting the GRB from the
Astro-COLIBRI interface

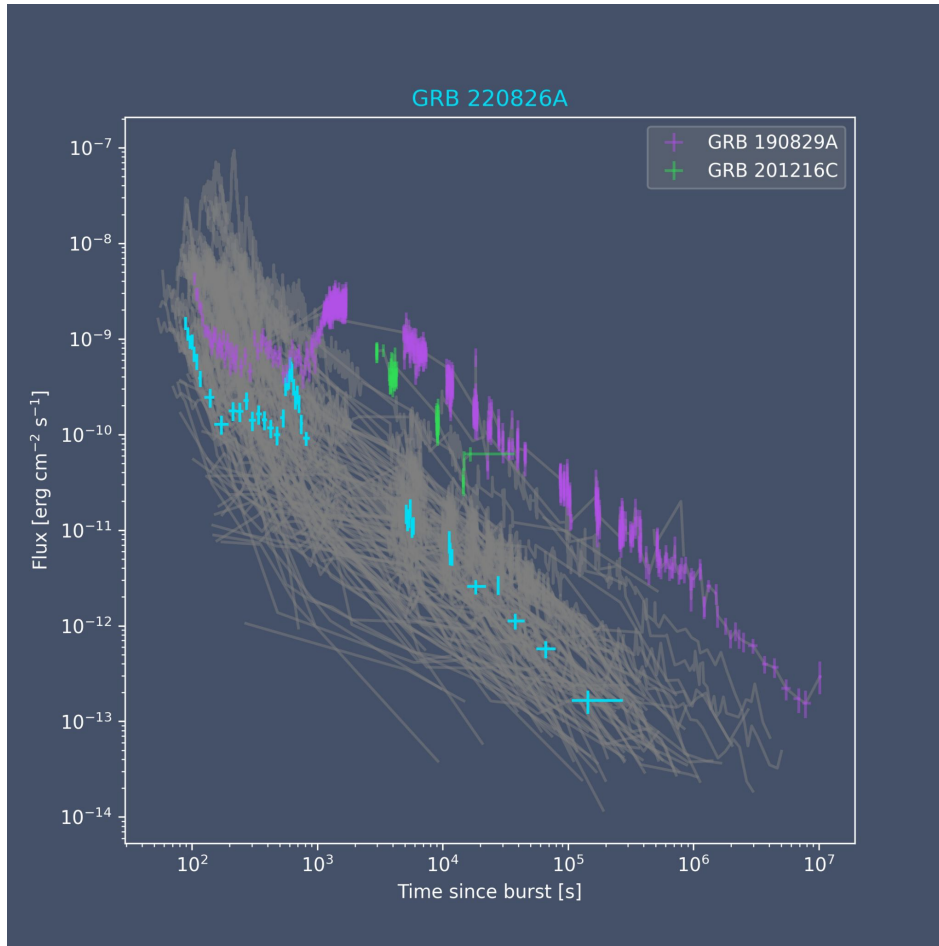


this is the part we developed and that will go in Astro-COLIBRI backend

The implementation

- We dugged into the `swifttools` that Phil advertised in his talk (thanks to Phil for pointing us to the docs!)
- We shared the work among us working on different parts of the scheme shown before
 - code snippets from each, then we tested them together
- Both the “update DB” and “get_grb_xrt_data” make queries to the Swift XRT GRB database
 - the former creates a Pandas dataframe, then saved in a pickle file for storage; it would be run monthly to update the catalog with new GRBs
- Runtime
 - ~6h for the creation of pickle file in “update DB”
 - few seconds for the query of the GRB data in “get_grb_xrt_data” (~6s)
 - plotting: negligible

Example of output: GRB 220826A



Observatories: Swift Fermi HAWC IceCube AMON Integral LVC other

Event types: FRB OT SN GRB burst neutrino GW other nuem 4FGL TeVCAT SGR/AXP

2020-12-14 2020-12-15 2020-12-16 2020-12-17 2020-12-18 2020-12-19 2020-12-20 2020-12-21 2020-12-22 2020-12-23 2020-12-24 2020-12-25 2020-12-26 2020-12-27 2020-12-28 2020-12-29 2020-12-30 2020-12-31

2020-12-17 19:20:52

GRB 201217A
Gamma-ray burst

RA/Dec: 273.28° / -65.13° (± 3.15°)
2020-12-17 02:35:03

GRB 201216C
Gamma-ray burst

RA/Dec: 16.37° / 16.52° (± 0.000°)
2020-12-17 00:02:54

GRB 201216C
Gamma-ray burst

RA/Dec: 17.88° / 16.80° (± 1°)
2020-12-16 23:07:25

GRB 201216C
Gamma-ray burst

Cone search

Custom cone search

RA / Dec: 16.37° 16.52°

source: GRB 201216C

radius: < 1° >

Detailed info about selected source: science mode

VoEvent : [Click here](#)

name: GRB 201216C

Detection time: 2020-12-17 00:02:54

Localisation:

RA [deg] : 16.37 Dec [deg] : 16.52

RA : 1h5m29.06s Dec : 16d30m59.76s

error [deg] : 0.00

observatory: Swift

comment: detected by MAGIC (GCN 29075), z=1.1 (X-shooter@VLT, GCN 29077)

[Search for ATels!](#)

visibility: 2022-09-29

Links for further details auto scroll

TOBY

Schedule and visibility of main observatories

TACH

GCN viewer: access to notices and circulars

GCN-n

GCN notices: rapid alert message

GCN-c

GCN circulars: announcements of new transient events

Swift

Overview of this Swift detected GRB

maybe add a button here "Show XRT lightcurve" and it will show a popup image like for visibility