

GRB 251013C

Proposal for a type 2 paper (12 Nov 2025) and data updated

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Multiple rebrightening
phases in the afterglow

Points of contact:

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COLIBRÍ: Jean-Grégoire Ducoin, Alan Watson

EP/FXT: Ziming Wang

UNAM: Noémie Globus

GRB 251013C (sb25101311): SVOM detection

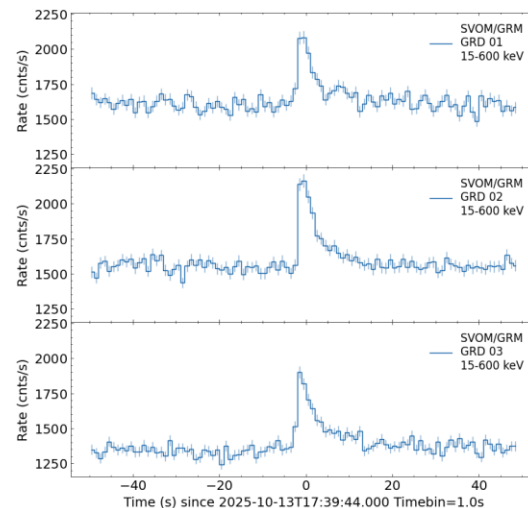
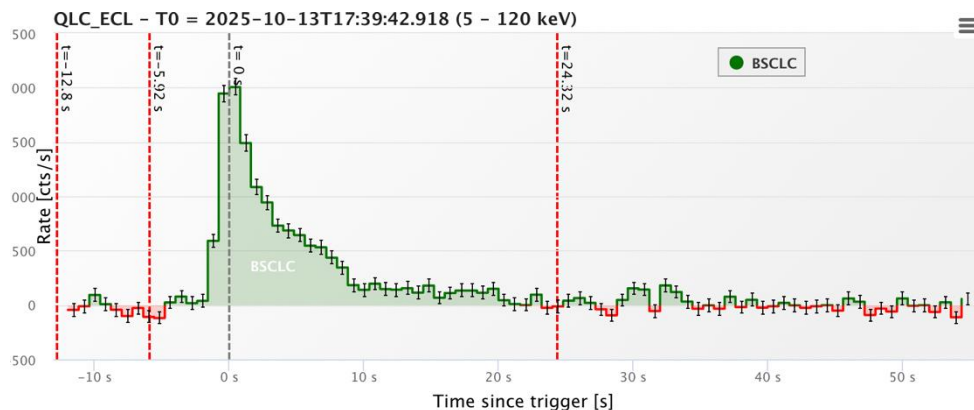
- Long GRB detected by SVOM/ECLAIRs+GRM (Fermi/GBM: sub-threshold), **slew performed**
 - T90_ECL = 17.1 (+6.9/-1.5) s at 2025-10-13T17:39:42 UTC
 - T90_GRM = 17.58 (+3.72/-5.51) s at 2025-10-13T17:39:43
- MXT slewed at 2025-10-13T17:43:05 UTC to the source within 69 arcsec err.
- VT observed the field at 2025-10-13T17:44:04 UTC (T-T0 = 261.08s)

VT position:

R.A. (J2000) = 23h03m20.6s

Dec. (J2000) = -0d12m37.1s

err: 0.5 arcsec



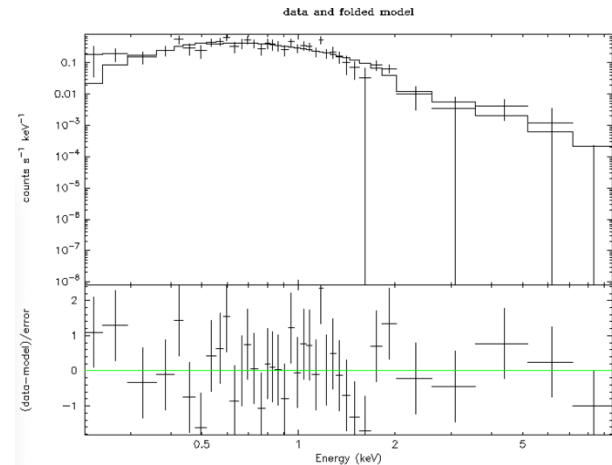
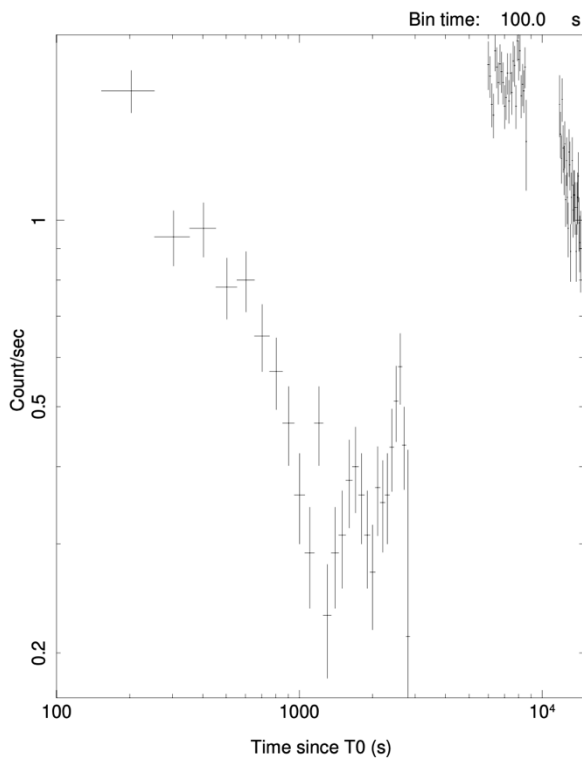
GRB 251013C (sb25101311): GCNs

42642. [GRB 251013C: Chandra X-ray observations and jet break detection](#)
42569. [GRB 251013C: TDT detection and Medium-band SED of Afterglow](#)
42492. [GRB 251013C: 3.4-m telescope of Iranian National Observatory \(INO340\) optical observations](#)
42399. [GRB 251013C: further SAO RAS optical observations](#)
42396. [GRB 251013C: ISON-Castelgrande observatory optical observations](#)
42338. [GRB 251013C: OHP/T193 third epoch optical observations and detected rebrightening](#)
42334. [GRB 251013C: Liverpool Telescope observations](#)
42333. [GRB 251013C: Leavitt Observatory optical photometry](#)
42319. [GRB 251013C: JinShan observations of the non-thermal rebrightening of the optical counterpart](#)
42318. [GRB 251013C: SVOM/COLIBRI \(FM-GFT\) observations of a strong and late rebrightening of the optical counterpart](#)
42312. [GRB 251013C: VLA detection](#)
42301. [GRB 251013C: Kilonova-Catcher optical afterglow detection](#)
42298. [GRB 251013C: Swift/UVOT Detection](#)
42295. [GRB 251013C, GCN Circular 42267, errata corrige](#)
42294. [GRB 251013C: detection of a radio counterpart at 15.5GHz](#)
42292. [GRB 251013C: SVOM/ECLAIRs refined analysis](#)
42283. [GRB 251013C: MAO/AZT-22 optical observations](#)
42281. [GRB 251013C: Swift ToO observations](#)
42279. [GRB 251013C: SVOM/COLIBRI \(FM-GFT\) further multi-band optical observations](#)
42276. [GRB 251013C: OHP/T193 further optical observations and possible color evolution](#)
42275. [GRB 251013C: Calapai Observatory, Massa S. Giorgio \(Messina\), optical observation](#)
42269. [GRB 251013C: Osservatorio Astronomico "Nastro Verde" optical observations: detection of a bright optical counterpart](#)
42267. [GRB 251013C: MarSEC, optical afterglow photometry](#)
42266. [GRB 251013C: OHP/T193 optical afterglow photometry and spectroscopy](#)
42262. [GRB 251013C: Bassano Bresciano Observatory optical observations](#)
42261. [GRB 251013C: Early and late-time optical counterpart detection by LCO](#)
42259. [GRB 251013C: Fermi GBM Observation](#)
42256. [GRB 251013C: NUTTeA-TAO / BSTI Early Measurements](#)
42254. [GRB 251013C: ULL-ASTRO-MASTER detection of the optical afterglow with the LCO 40-cm telescope at Sutherland Observatory](#)
42253. [GRB 251013C: Asiago optical observations](#)
42251. [GRB 251013C: ABObservatory optical observations](#)
42248. [GRB 251013C: J band observations by SYSU 80cm infrared telescope](#)
42247. [GRB 251013C: EP-FXT counterpart detection](#)
42246. [GRB 251013C: AstroSat CZTI detection](#)
42243. [GRB 251013C: ALMA detection](#)
42242. [GRB 251013C: SVOM/COLIBRI \(FM-GFT\) detection of the optical counterpart](#)
42241. [GRB 251013C: DDOTI detection of the optical afterglow](#)
42240. [GRB 251013C: SLKT optical afterglow photometry](#)
42235. [Fermi GRB 251013C: Global MASTER-Net observations report](#)
42232. [GRB 251013C: Swift-XRT counterpart detection](#)
42231. [GRB 251013C: GOTO optical afterglow detection](#)
42230. [GRB 251013C: SAO RAS optical observations](#)
42229. [GRB 251013C: LCO optical afterglow detection](#)
42228. [GRB 251013C: Optical Observations via Virtual Telescope Project, Italy](#)
42227. [GRB 251013C: NOT spectroscopic redshift \$z = 0.572\$](#)
42226. [GRB 251013C: LAST detection of optical counterpart](#)
42225. [GRB 251013C: BOOTES-6 early optical detection](#)
42223. [GRB 251013C: SVOM/VT optical observation](#)
42222. [GRB 251013C: SVOM detection of a burst](#)
42221. [GRB 251013C: Fermi GBM Final Real-time Localization](#)

- Link [here](#)
- $z = 0.572$ (NOT)
- Optical counterpart: VT, BOOTES (170 sec after the detection), OHP/T193, NOT, SYSU 80cm (J-band), ...
- Detection up to radio bands
- Chandra data will be public (late afterglow at $T+T_0 = 27.396$ days)

GRB 251013C (sb25101311): SVOM/MXT

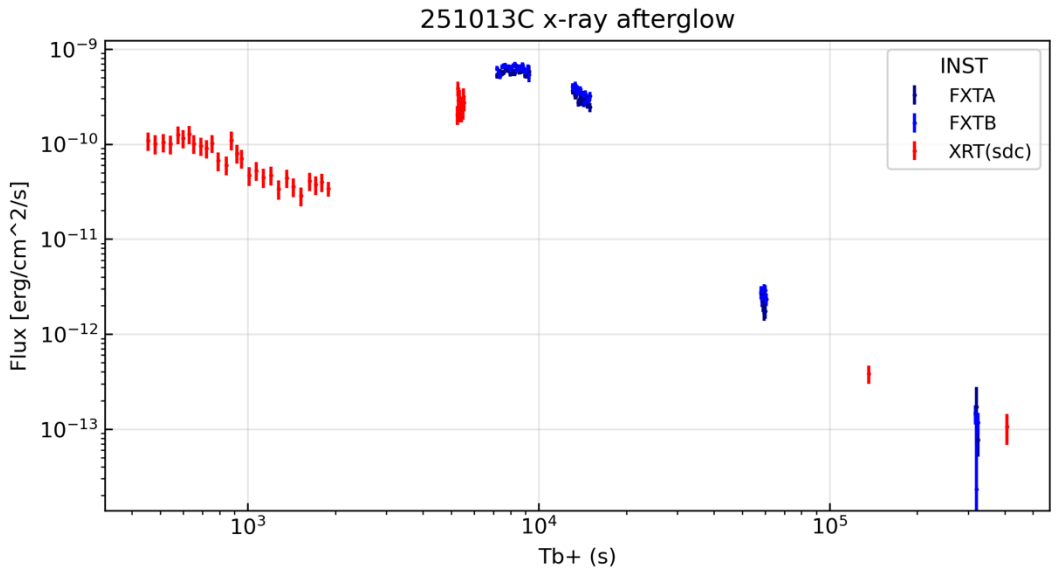
- MXT slewed at 2025-10-13T17:43:05 UTC to the source within 69 arcsec
- From T0+ ~200 to ~20 ks



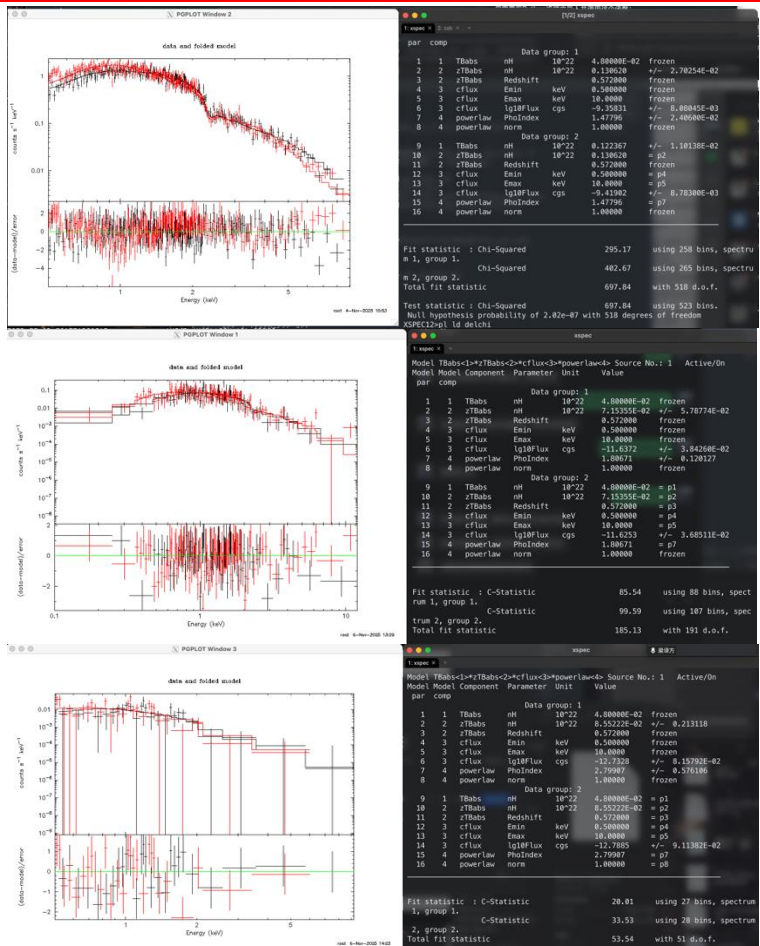
Model phabs<1>zphabs<2>powerlaw<3> Source No.: 1 Active/On						
Model	Model Component	Parameter	Unit	Value		
par comp						
1	1	phabs	nH	10^22	4.00000E-02	frozen
2	2	zphabs	nH	10^22	0.214131	+/- 7.76556E-02
3	2	zphabs	Redshift		0.572000	frozen
4	3	powerlaw	PhoIndex		2.39818	+/- 0.314745
5	3	powerlaw	norm		1.92819E-02	+/- 2.30573E-03
Fit statistic : Chi-Squared 32.11 using 38 bins.						
Test statistic : Chi-Squared 32.11 using 38 bins.						
Null hypothesis probability of 6.08e-01 with 35 degrees of freedom						

GRB 251013C (sb25101311): EP/FXT

- 3 ep-fxt ToO carried out at:
7x10³ (4000s); 5x10⁴ (3000s) by svom group
3x10⁵ (6000s)seconds by Shuaiqing Jiang
- Spectra fit well with absorbed power-law



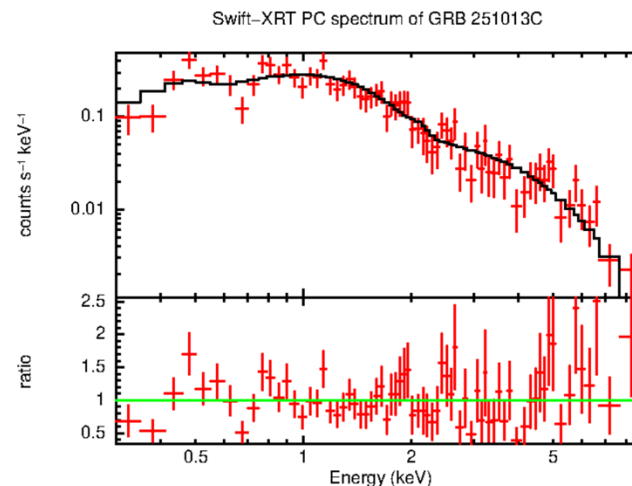
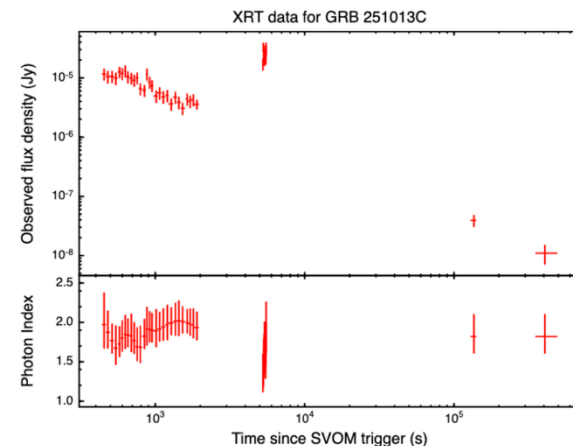
XRT data credit: *Swift* sdc
https://www.swift.ac.uk/xrt_spectra/03000137/



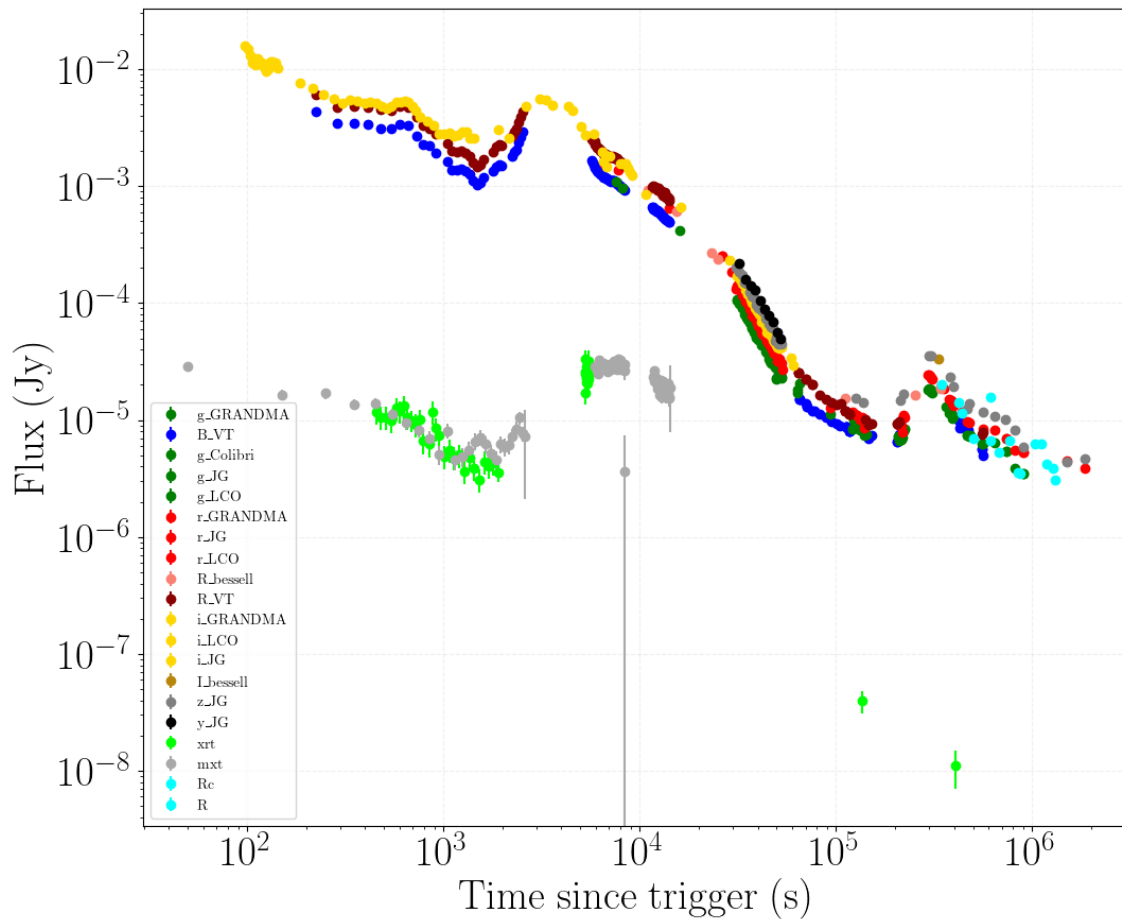
GRB 251013C (sb25101311): *Swift*/XRT

- 8 ToO from T0+445 to 5529s

N_H (Galactic)	$4.81 \times 10^{20} \text{ cm}^{-2}$
N_H (intrinsic)	$3 (+8, -3) \times 10^{20} \text{ cm}^{-2}$
z of absorber	0.572
Photon index	$1.77 (+0.13, -0.11)$
Flux (0.3-10 keV) (Observed)	$8.6 (+0.7, -0.7) \times 10^{-11} \text{ erg cm}^{-2} \text{ s}^{-1}$
Flux (0.3-10 keV) (Unabsorbed)	$9.5 (+0.7, -0.6) \times 10^{-11} \text{ erg cm}^{-2} \text{ s}^{-1}$
Counts to flux (obs)	$3.72 \times 10^{-11} \text{ erg cm}^{-2} \text{ ct}^{-1}$
Counts to flux (unabs)	$4.11 \times 10^{-11} \text{ erg cm}^{-2} \text{ ct}^{-1}$
W-stat (dof) What's this?	342.54 (347)
Spectrum exposure	1.8 ks



GRB 251013C (sb25101311): Dataset (updating...)



GRB 251013C (sb25101311): Some key points and goals

- SVOM GRB where there was a long multicolor monitoring with COLIBRÍ: until 2025-11-09 (from 8.65 h to ~26 days after the trigger)
 - A possible SN association at $T+T_0 \sim 12-13$ days
 - Multiepoch SED fitting: see the evolution
 - Model the non standard afterglow light curve: try to understand what causes the rebrightening events assuming different models for the central engine
- Members from UNAM-Mexico are happy to work on the modelisation part (Contact: Noémie Globus; email: globus@astro.unam.mx)
- Next steps in the preliminary agenda:
Now-next month month: Continue to contact potential collaborators and collect the data, organize a first meeting to create a «plan de travail»