«Maidanak observatory for observations of astrophysical transients»

Alexei Pozanenko

(on behalf of GRB-IKI-FuN)

Space Research Institute (IKI), Moscow

MUM6, 02-11-2021

Outline

- “Fast” transients
  - GRB
  - TDE
  - Orphans
  - LVK EM counterparts
  - Neutrino counterparts?
- Our experience (including AZT-22)
- Strategy (Multi wavelength Follow up)
- Tactic for AZT-22 (how to?)
- Suggestions for AZT-22 (coordinating, collaborating, data sharing)

“Fast” transients

- Gama-Ray Burst (GRB) and associated phenomenon (prompt, afterglow, Supernova, host galaxy)

  See talks today by Sergey Belkin, and Alina Volnova

- Tidal disruption events (TDE), microquasars

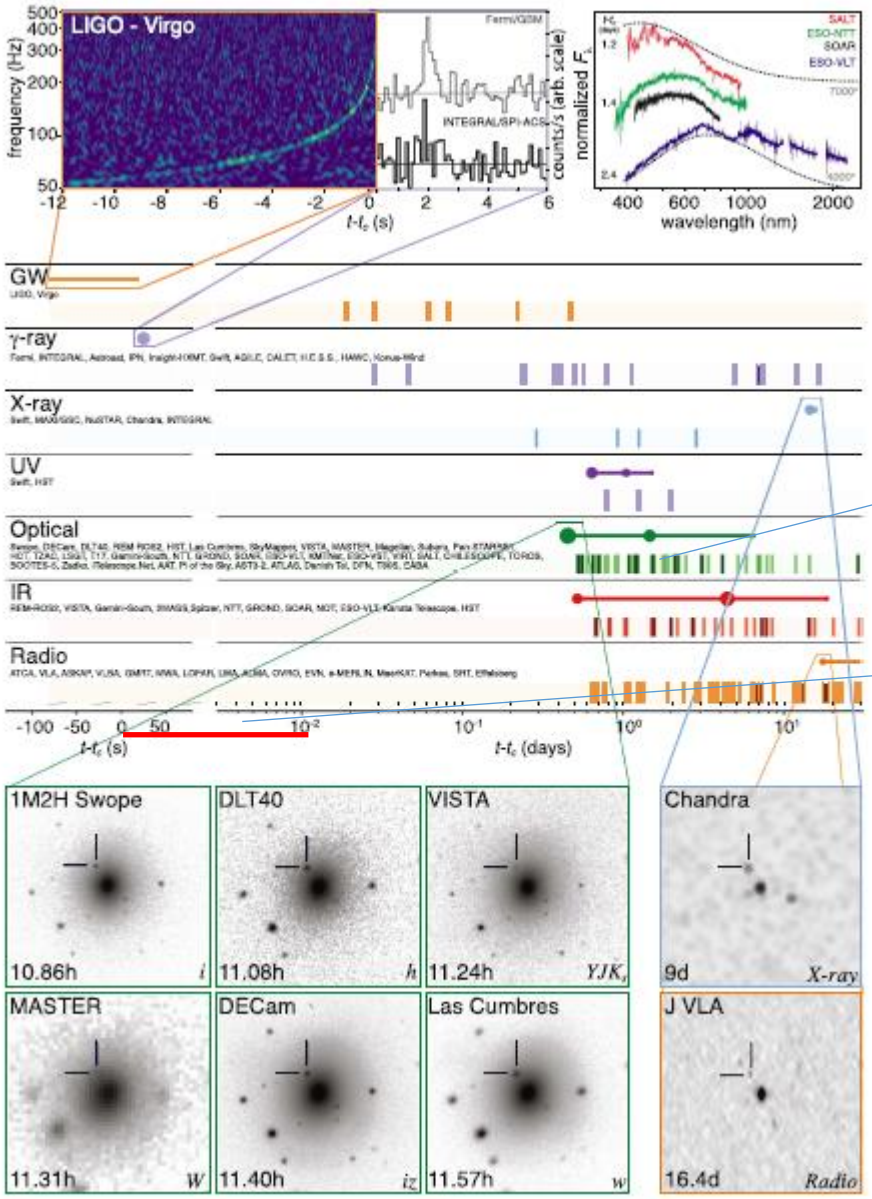
- Optical orphans (ZTF fast decaying transients, can be GRB orphans)

- LIGO/Virgo/Kagra EM counterparts (short GRBs after NS-NS merging)
  - Afterglow
  - Kilonova

Our Experience

- Regular GRBs optical follow up with GRB-IKI- FuN Network
  - Afterglow, SN related, host galaxy
  - Promising ZTF candidates
  - More 20 rpapers +1 PhD, 2 Master based on Maidanak data
- GRB 170817A/ BNS GW 170817
  - search for optical counterpart, kilonova observations,
  - Gamma-ray data analysis GBM/Fermi, SPI-ACA/INTEGRAL
  - Model of off-axis jet emission + thermal heating
- BNS GW 190425
  - search for optical counterpart (no optical counerpat)
  - Short GRB 190425 associated with GW 190425 discovery in SPI-ACS/INTEGRAL data

GW170817 and GRB 170817A

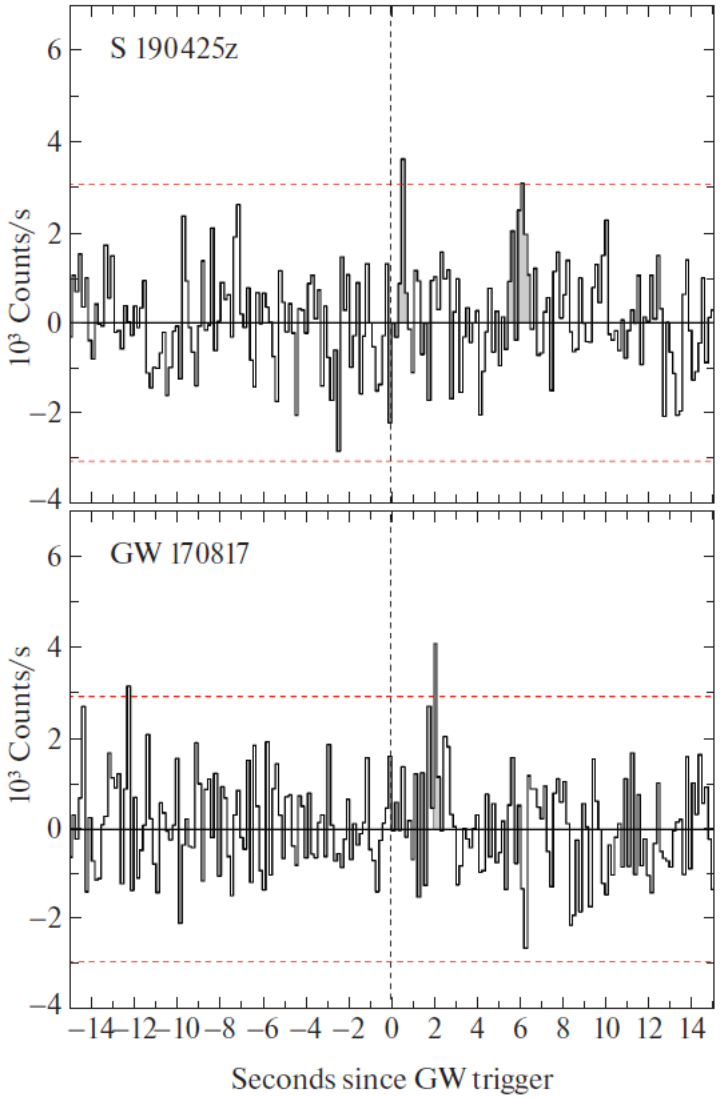


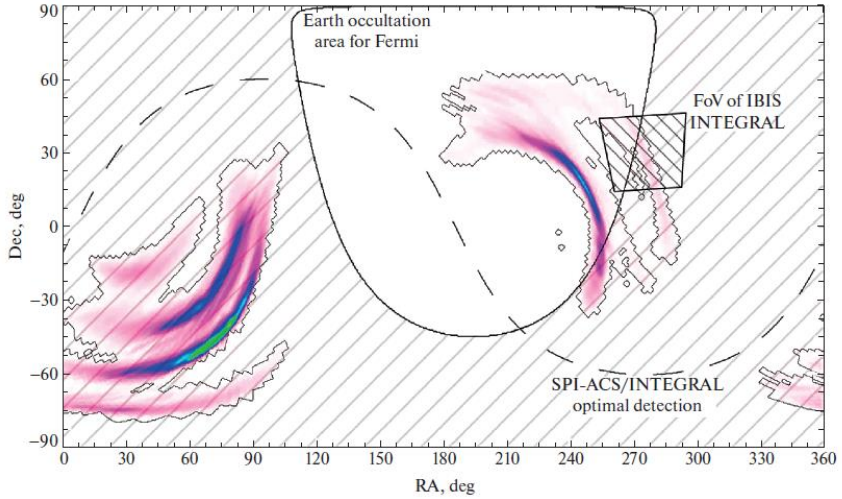
Chronology

RC-1000

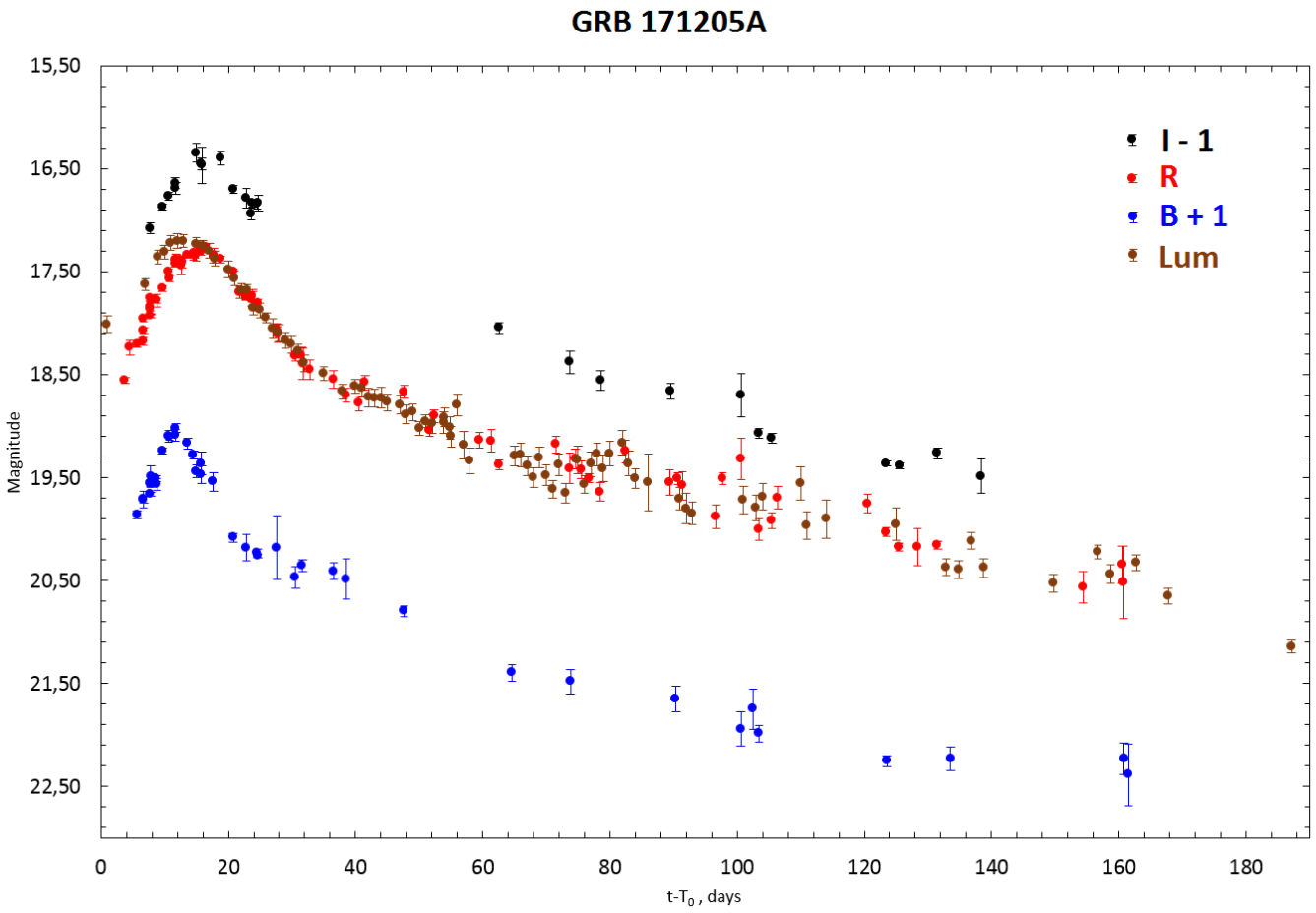
BSA/110MHz

GRB 190425 of GW 190425 in SPI-ACS/INTEGRAL

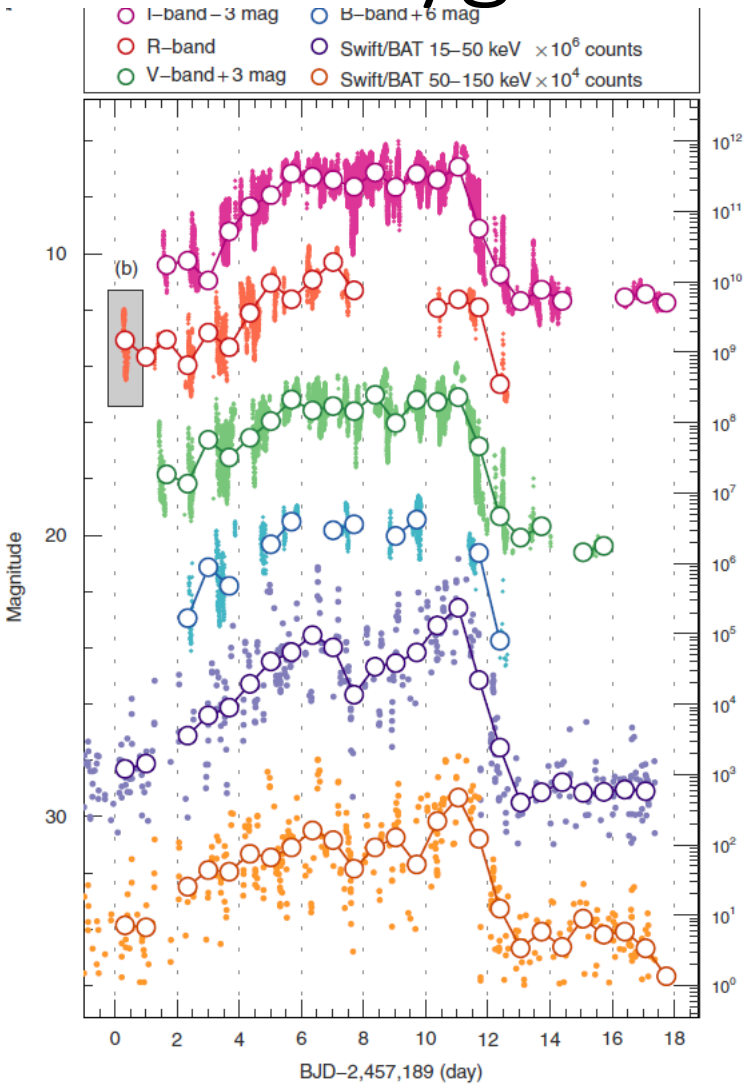




GRB 171205A / SN 2017iuk



V404 Cygni


I–band – 3 mag
R–band
V–band + 3 mag
B–band + 6 mag
Swift/BAT 15–50 keV ×10^6 counts
Swift/BAT 50–150 keV ×10^4 counts
(b)
Magnitude
10
20
30
0
2
4
6
8
10
12
14
16
18
BJD–2,457,189 (day)
10^12
10^11
10^10
10^9
10^8
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0

Strategy for transient observations

- Follow up observations of multi-messenger transient events (gravitational wave, neutrino, gamma-ray transients)
- Multi wavelength follow up of the events (radio, NIR, optic)

“Fast” transients at AZT-22

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- Tidal disruption events, microquasars
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Tactic for transient observations at AZT-22

- GRB - continue to follow up small error boxes, Multicolor photometry, search for SN/KN associated
- LVK
  - To observe only NS-NS and NS-BH mergers (no more than 10% of total LVK triggers
  - Due to typical huge localization area of gravitational wave events (> 30 deg^2) it is possible to cover only small part of the area. Even using network of the small FOV telescopes
  - To observe only potential host galaxy within LVK localization vollume

LVK next run?

- O4 will not start before August 2022 and may be delayed –:(
- There is still time to elaborate tactic and collaboration at Maidanak AZT-22 about LVK events

Suggestions
(the same after MUM5)

- Coordinating (do not repeat the same target observations)
- Collaborating
  - Data only from Maidanak usually cannot be base for standalone paper –(
- Data sharing between Maidanak collaborators

Good Luck for Maidanak!

~~~~~~~~ Thank you for attention! ~~~~~~~~
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