



The optical light curves of recent GRBs and SN evidence

A. Volnova, A. Pozanenko

(IKI RAS, Moscow, Russia)

on behalf of a collaboration for GRB

130427A, GRB 130702A, and GRB 130831A



GRB-SN connection

- GRB-SN link was suggested before the first afterglows were observed (Paczynski 1986). The reason was: similar energetics and similar cosmological distance scale.
- 5 spectroscopically confirmed GRB-SN associations:
 - GRB 980425 / SN 1998bw
 - GRB 030329 / SN 2003dh
 - GRB 031203 / SN 2003lw
 - GRB 060218 / SN 2006aj
 - GRB 100316D / SN 2010bh
- There are 25 more cases of GRB-SN associations without spectroscopical confirmation (Hjorth&Bloom 2011).

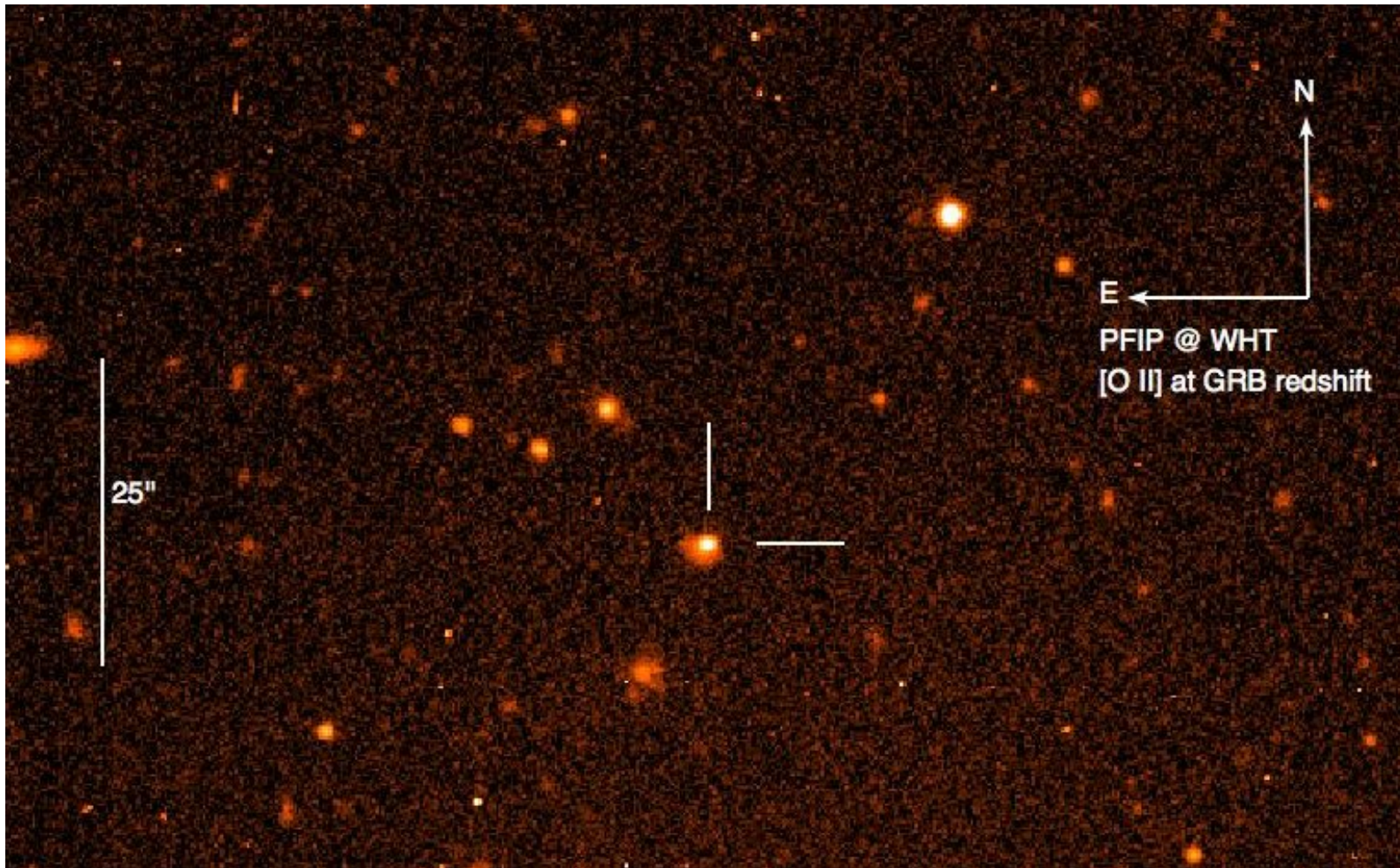


- Recently in this box of GRB-SN events appeared 3 more bursts:
 - GRB 130427A
 - GRB 130831A
 - GRB 130702A

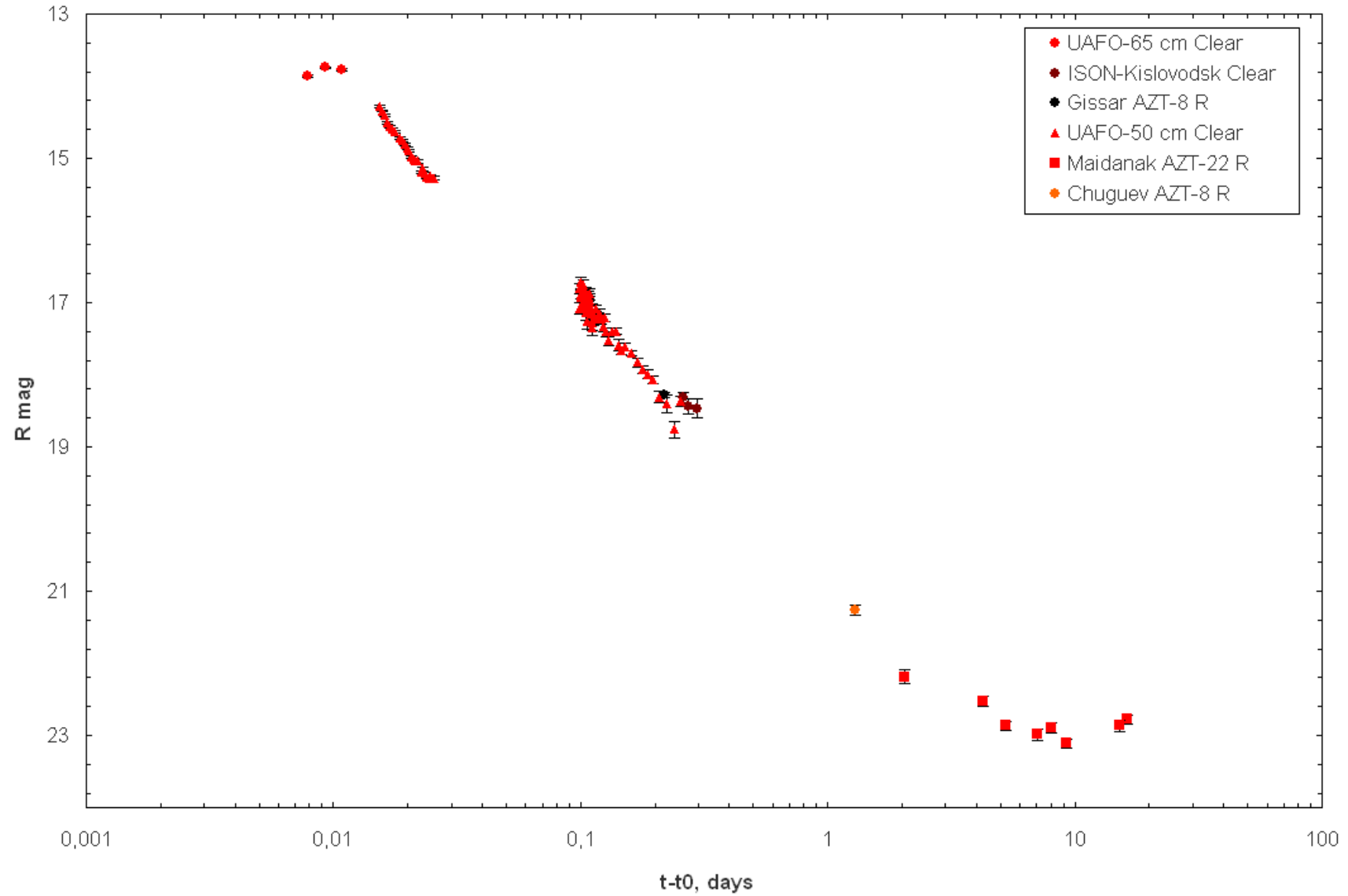


GRB 130427A

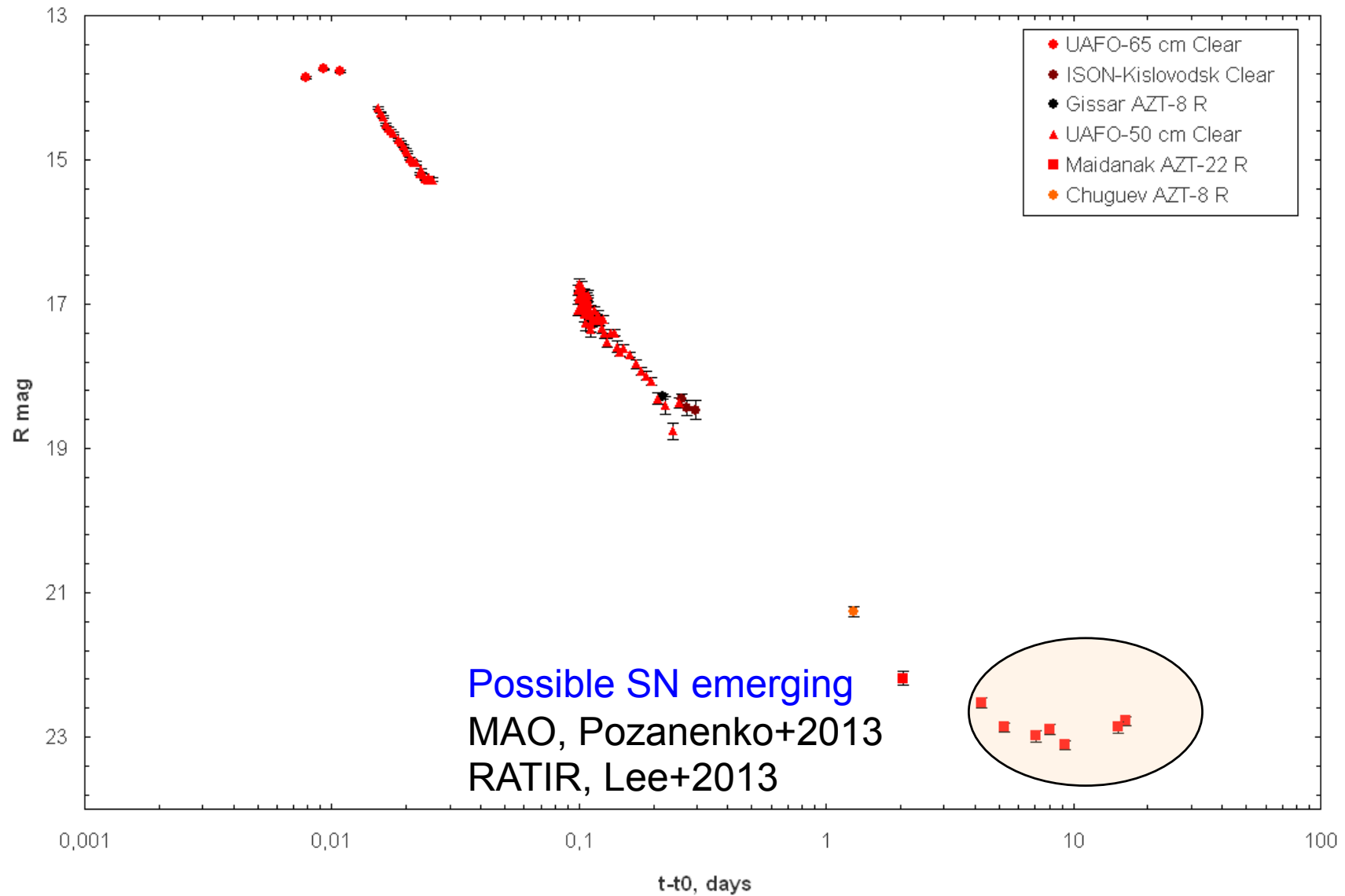
Wiersema+2013



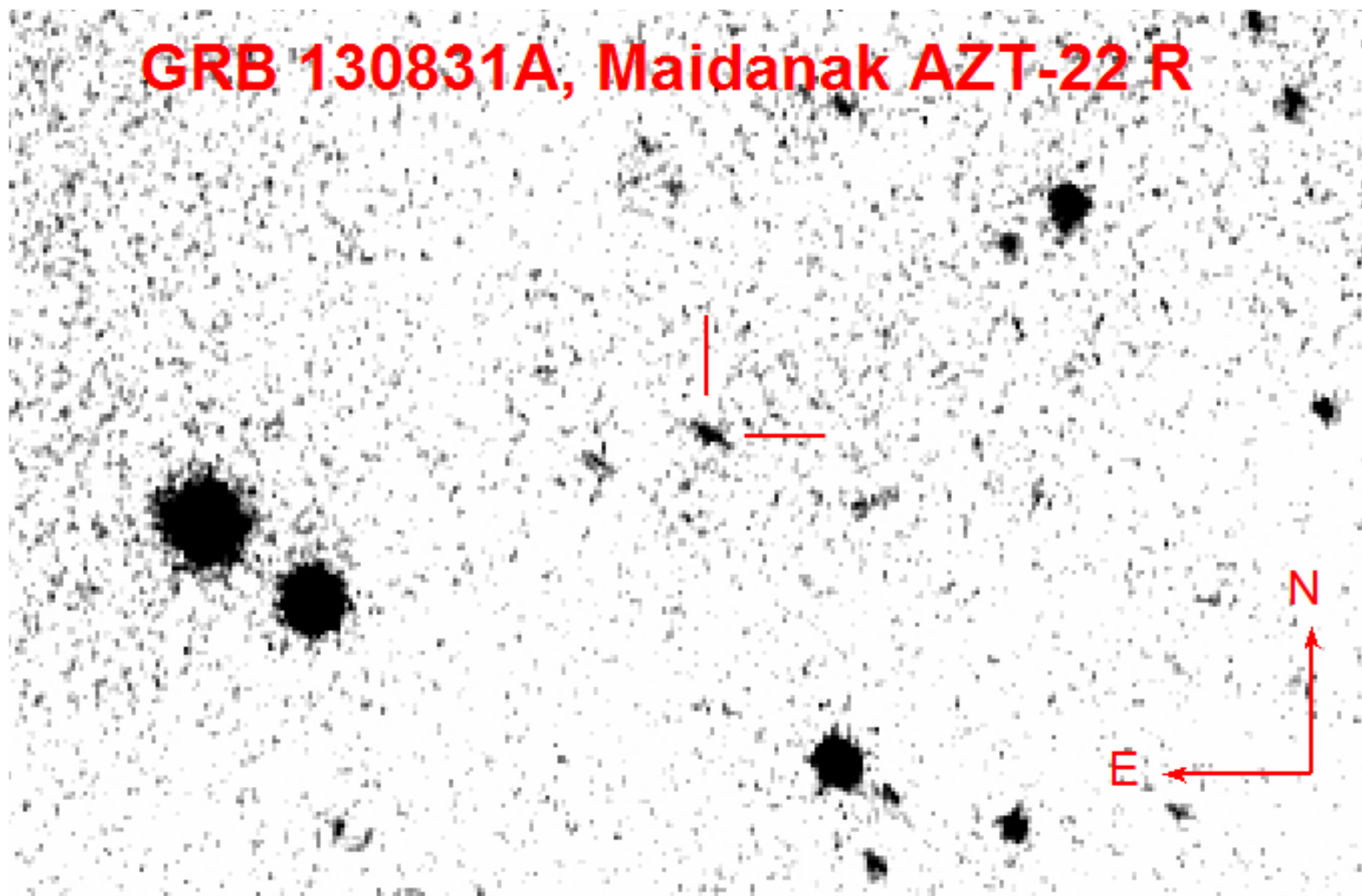
GRB 130831A



GRB 130831A

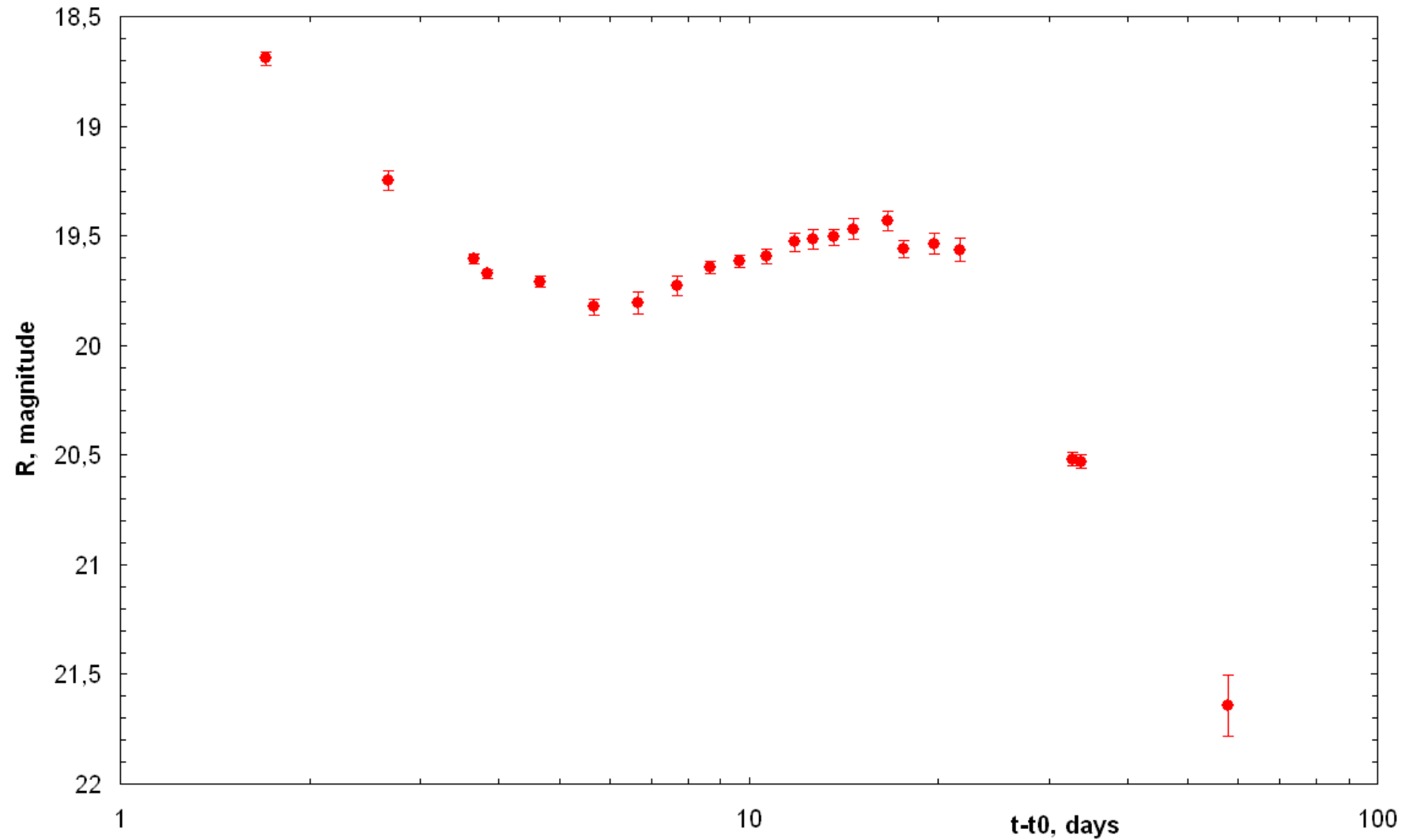


GRB 130831A



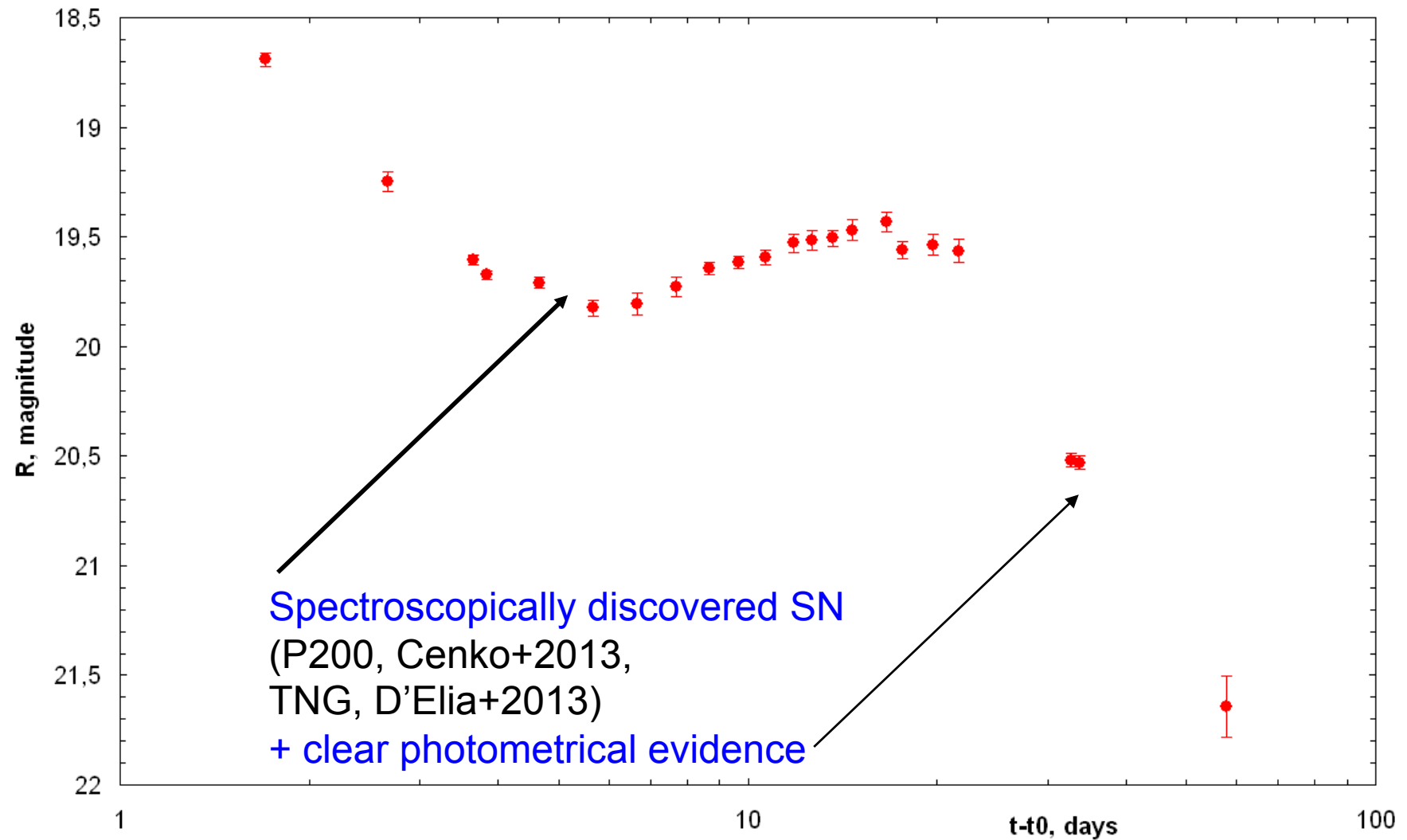
GRB 130702A (= Fermi394416326)

GRB 130702A



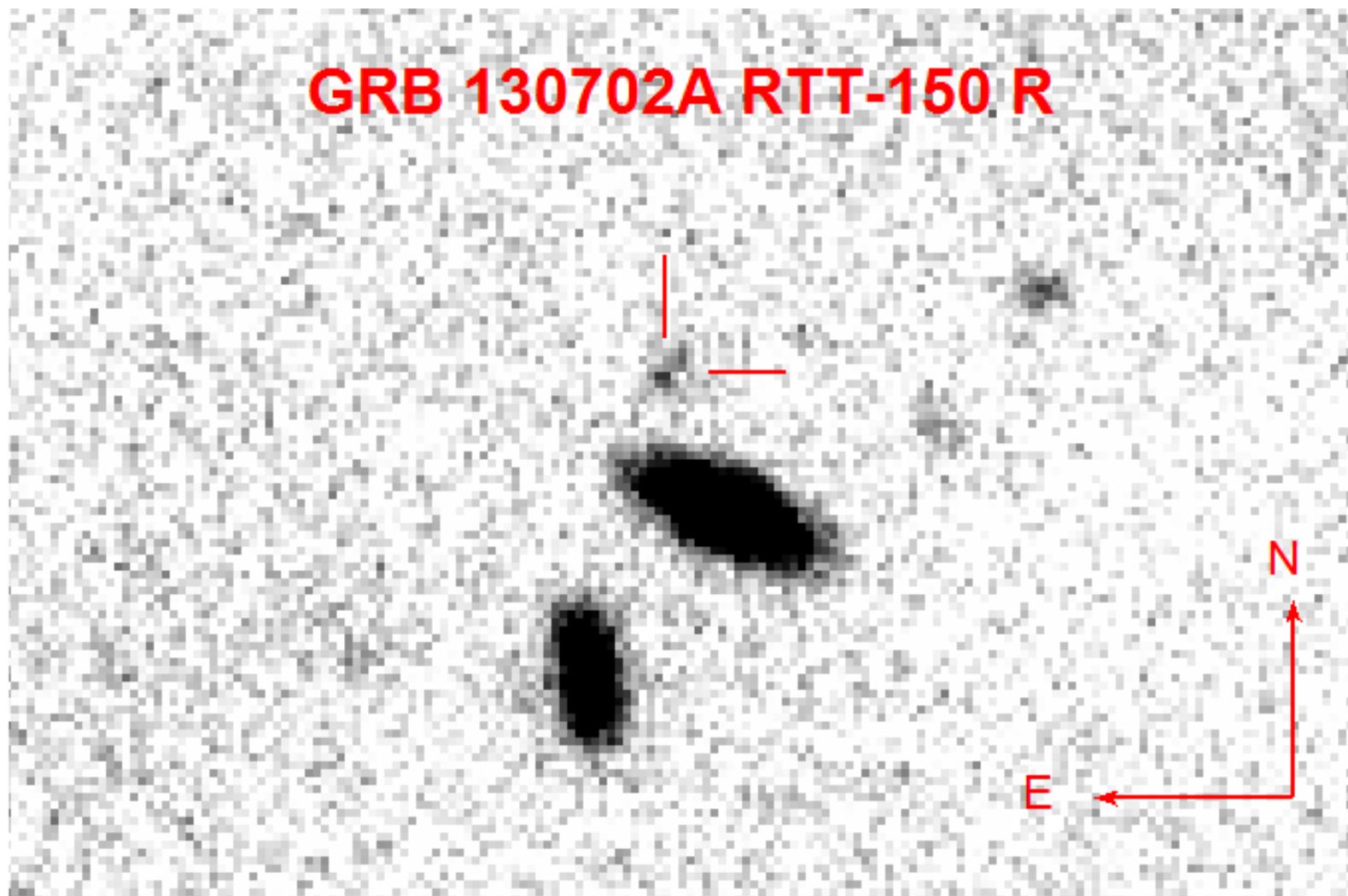
GRB 130702A (= Fermi394416326)

GRB 130702A

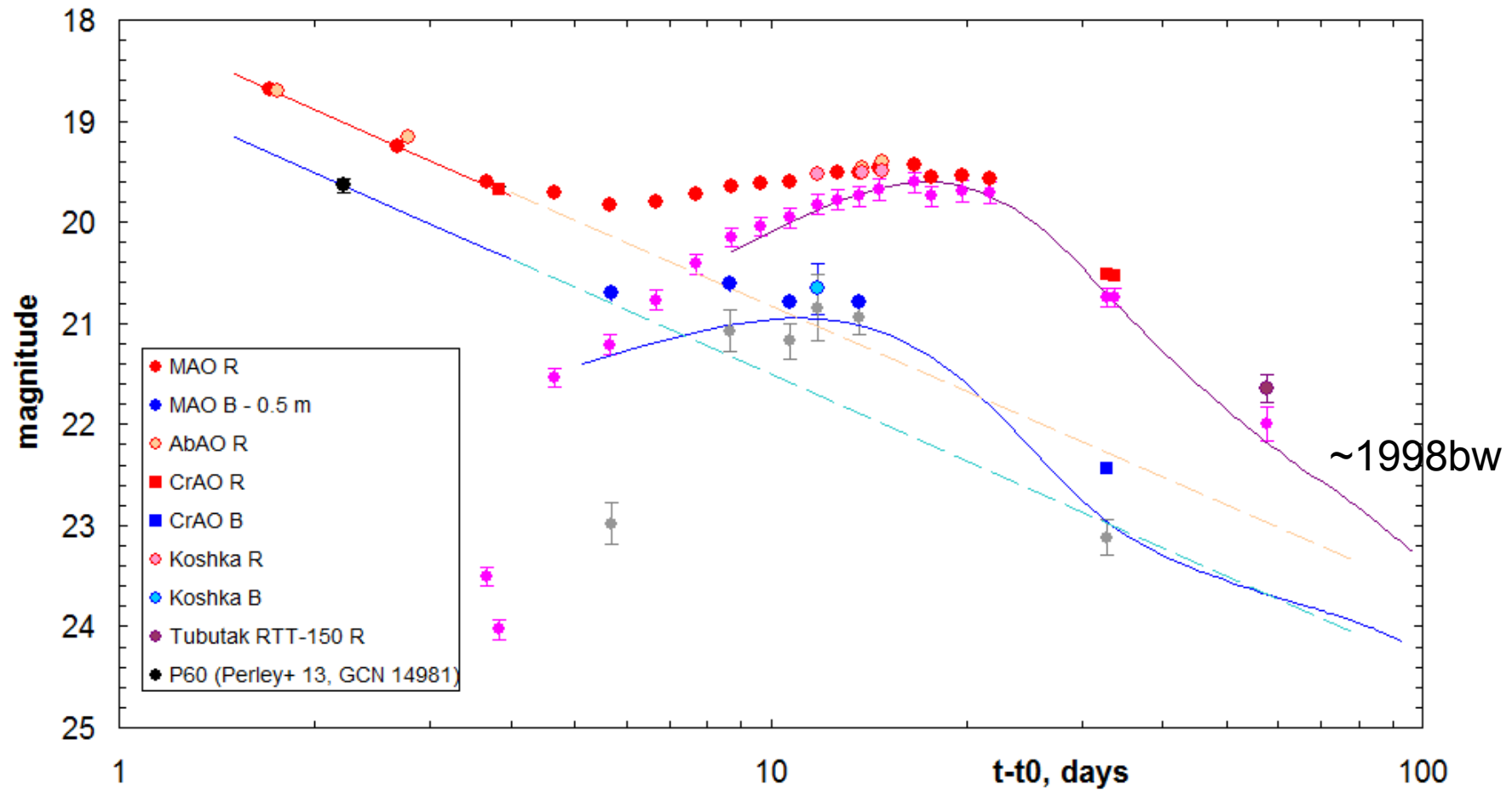


GRB 130702A (= Fermi394416326)

Khorunzhev+2013



GRB 130702A (= Fermi394416326)





GRB 130702A (= Fermi394416326)

	130702A	1998bw**
Z	0.145*	0.0085
M_R	-19.56	-19.28
$L(L_{\text{Sun}})$	5.7×10^9	4.4×10^9 erg/s

* Leloudas+2013

** Galama+1998



Conclusions:

- 2 more reliable GRB-SN connections;
- more observational evidence for the link of long GRBs to core collapse of massive stars;
- observations of presented 3 GRBs are continuing.



Thank you for your attention!