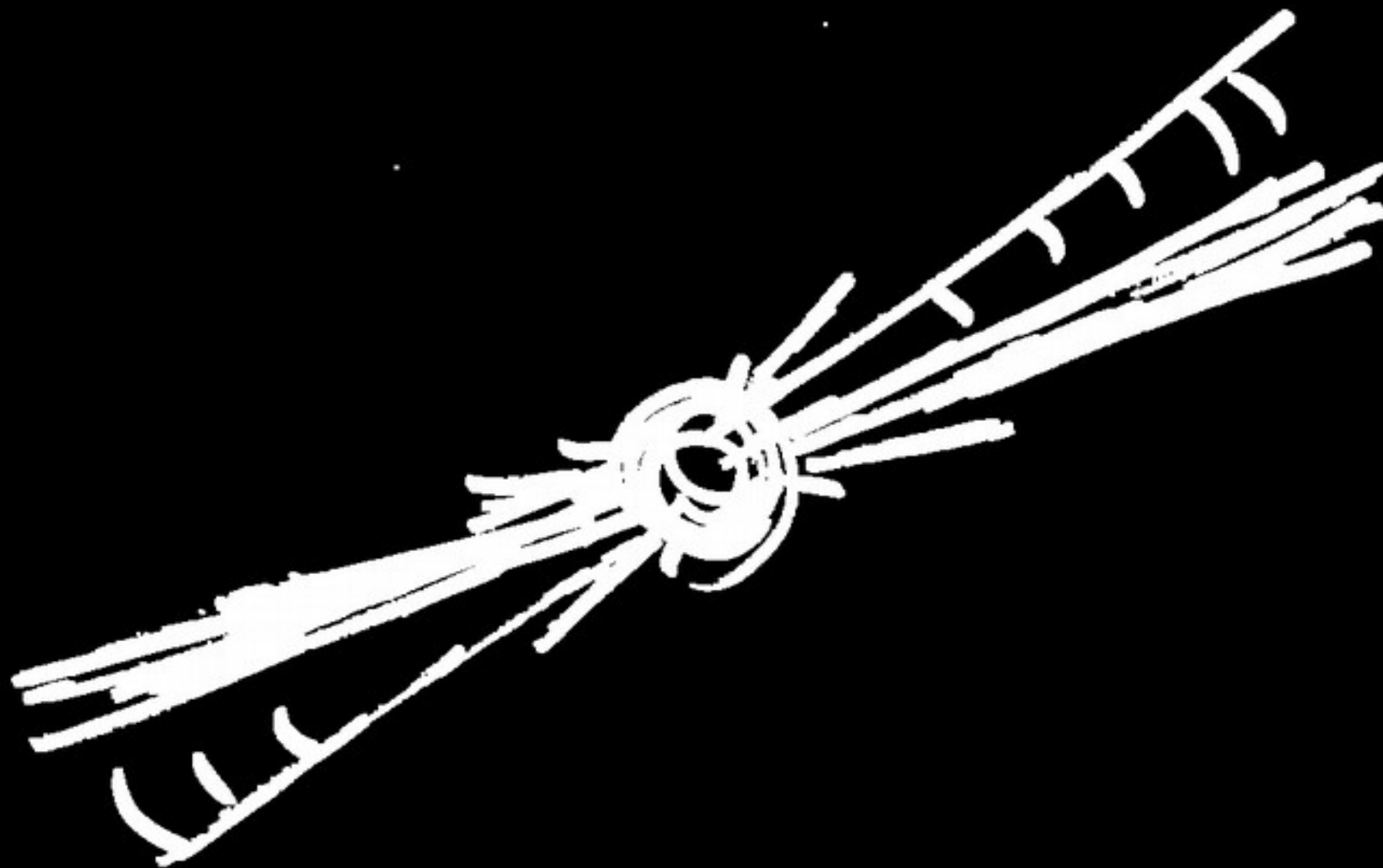


GAMA ZÁBLISKY

Martin Jelínek

OPAKOVÁNÍ



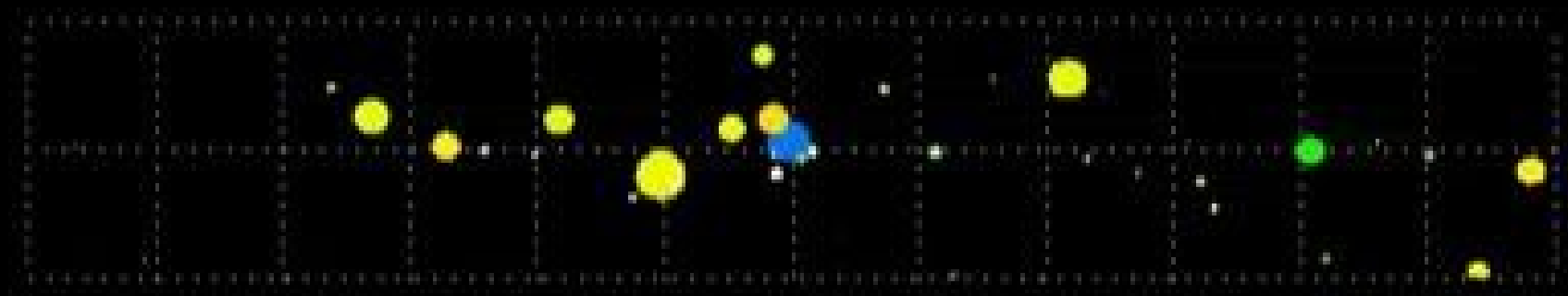
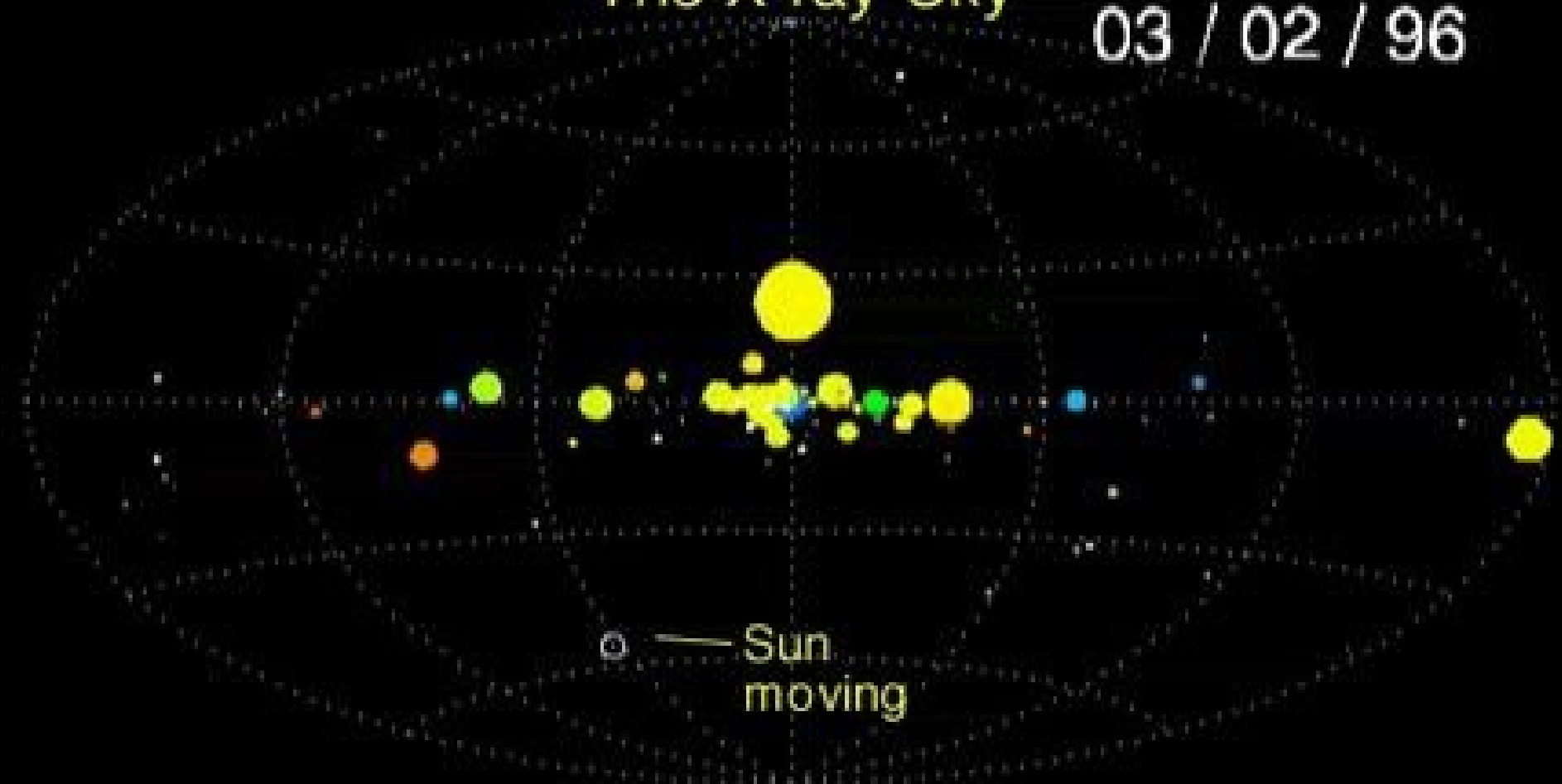


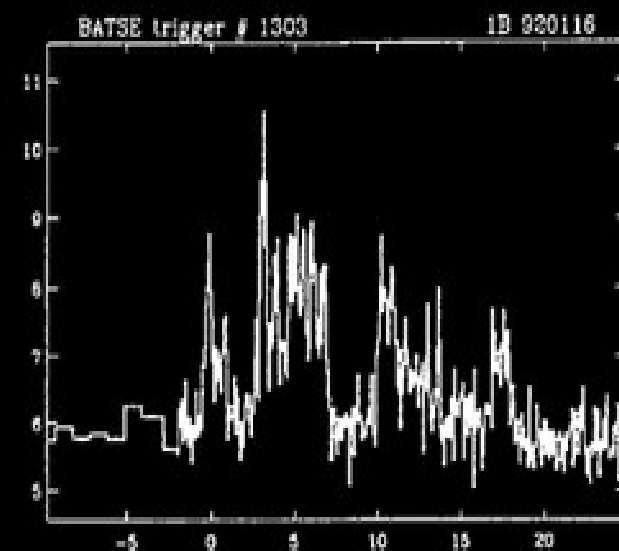
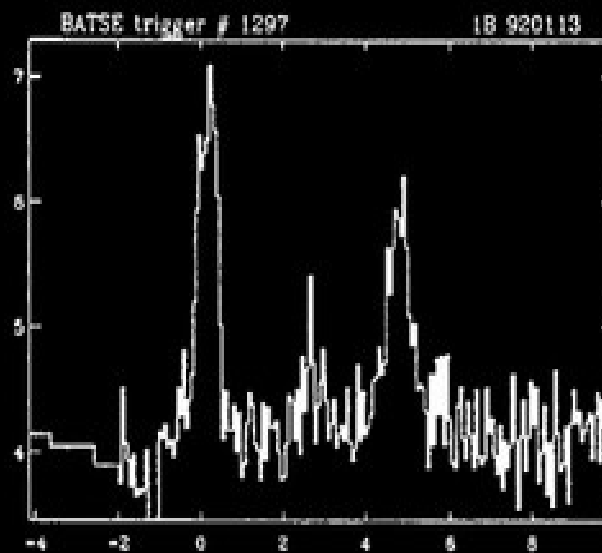
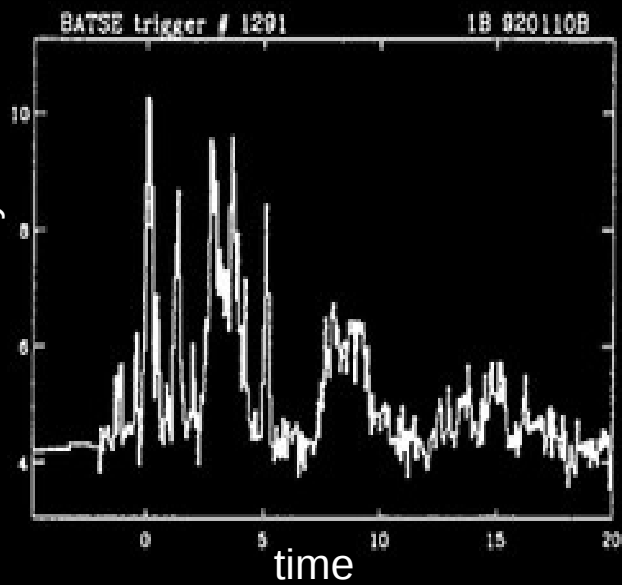
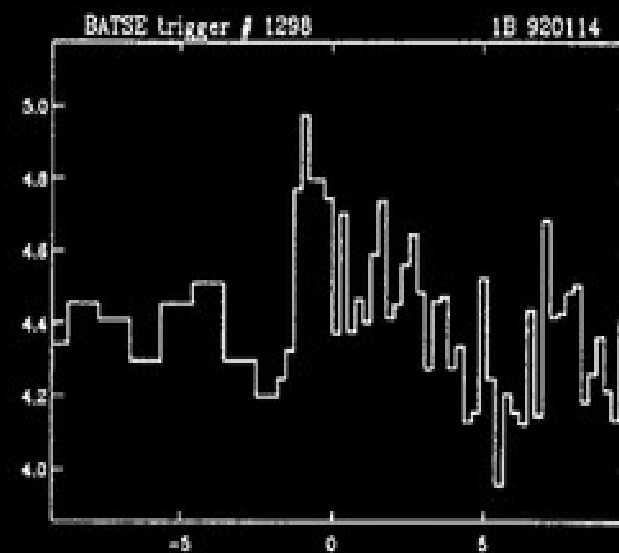
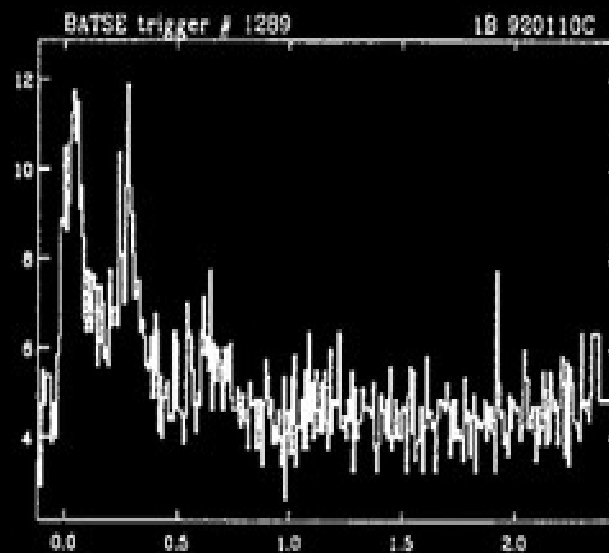
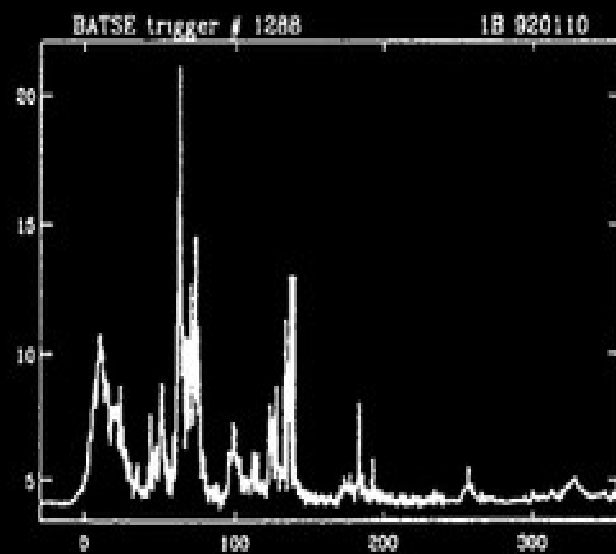




The X-ray Sky

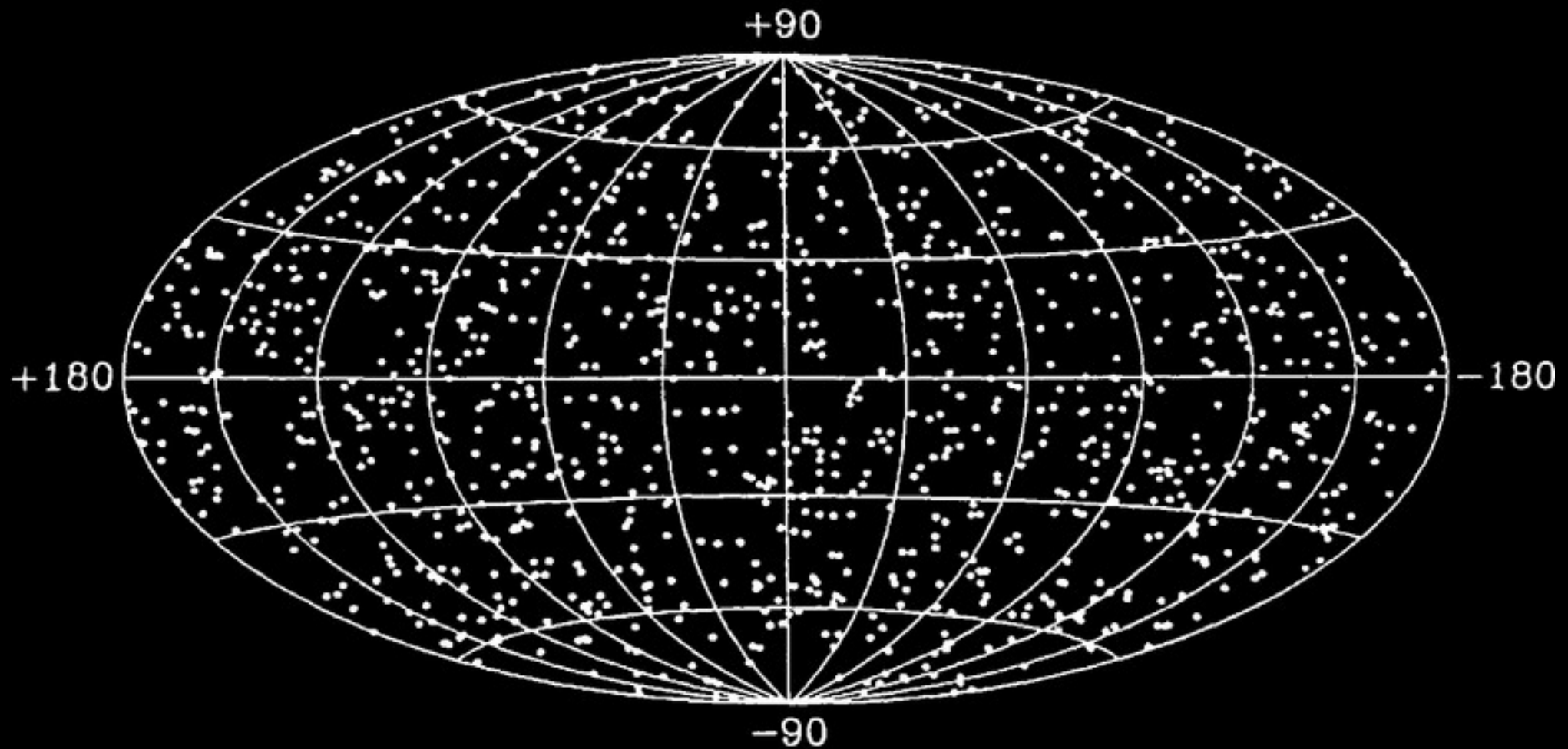
03 / 02 / 96





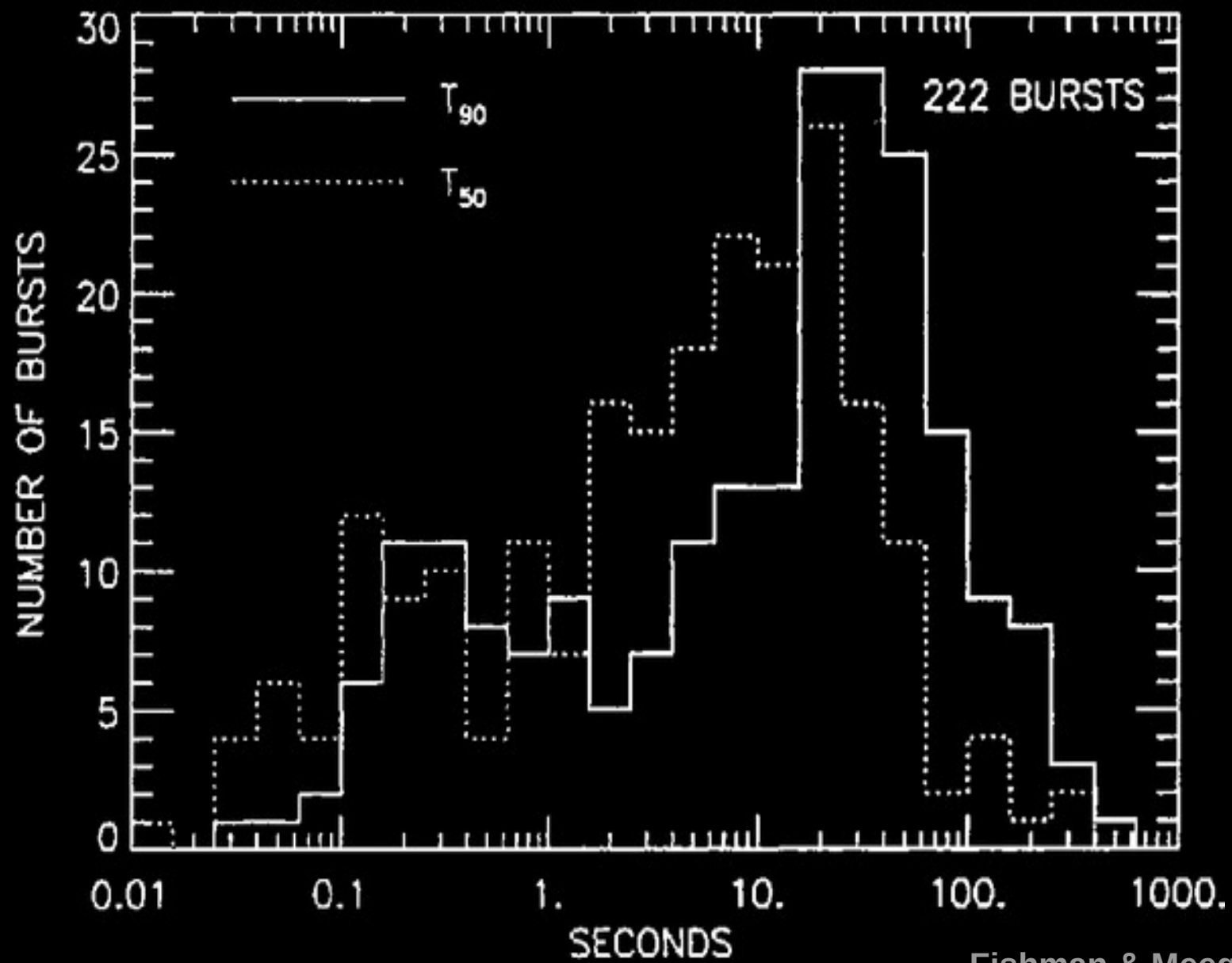
I. GAMMA-RAY BURSTS

1121 BATSE Gamma-Ray Bursts



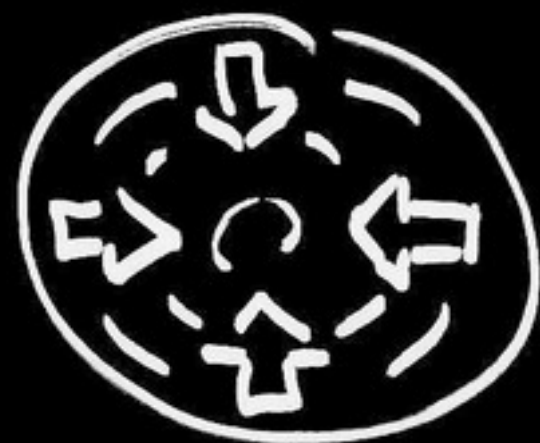
Galactic Coordinates

Fishman & Meegan (1995)



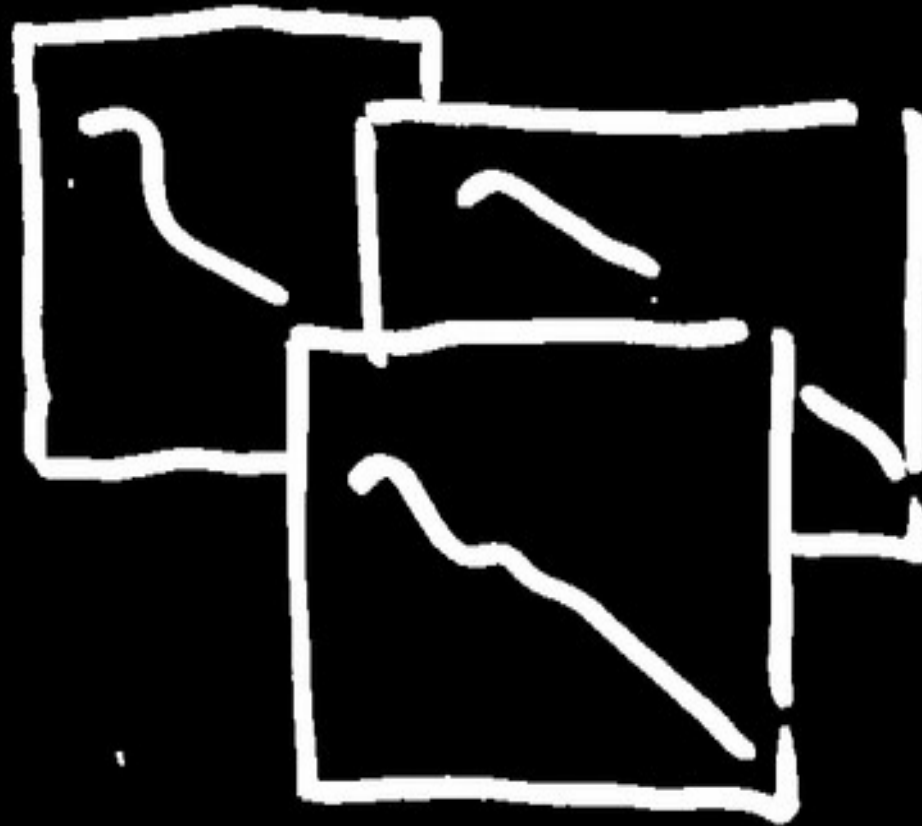


NS-NS MERGER



COLLAPSAR

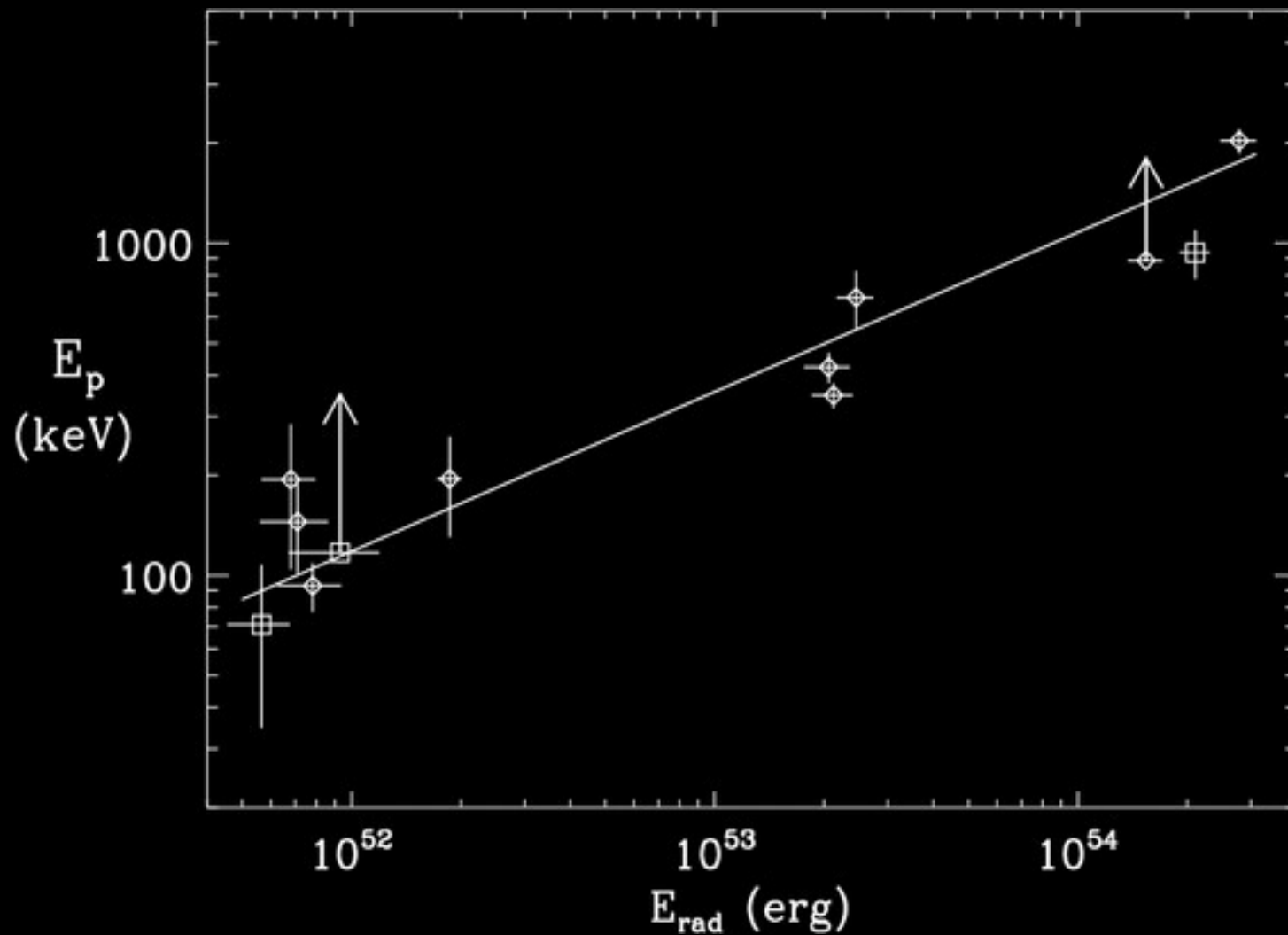
2. POKRAČOVÁNÍ



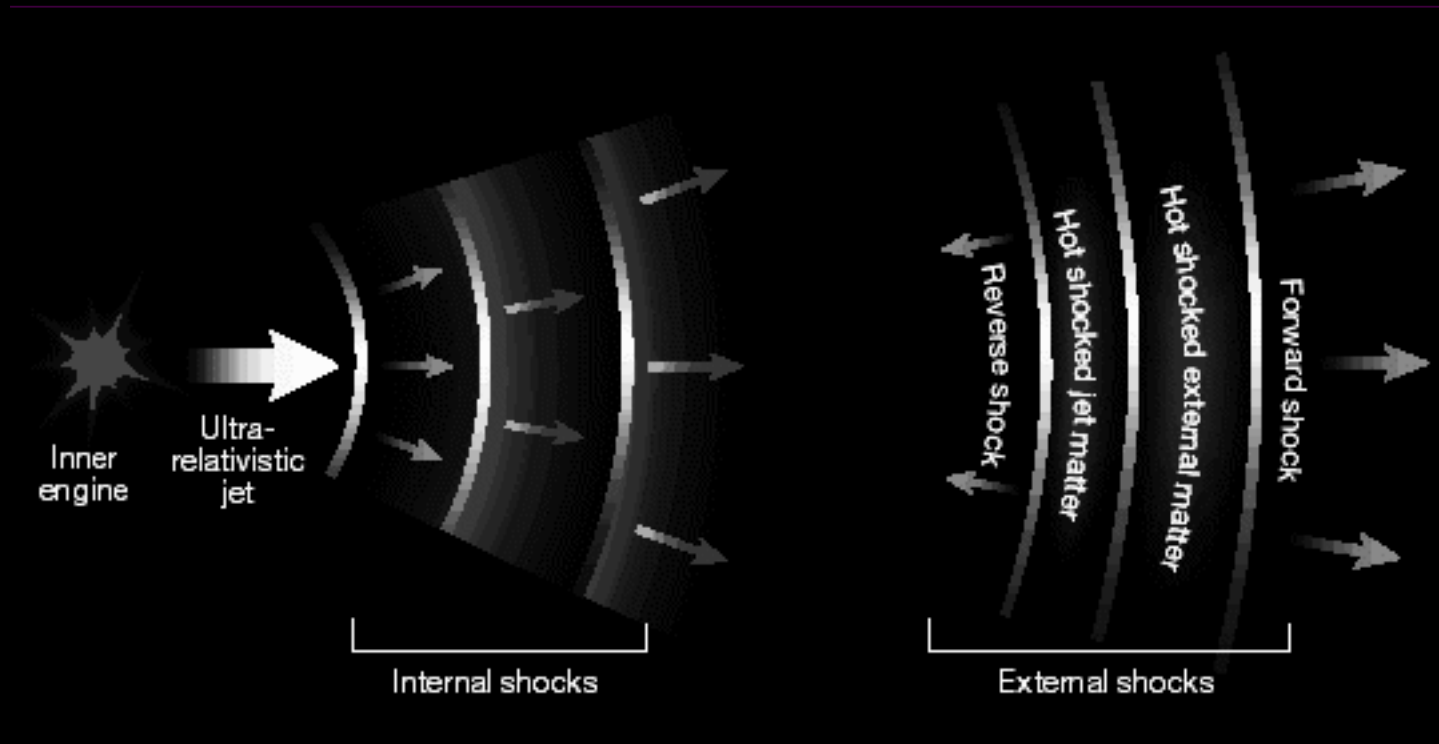
Čím se liší krátké a dlouhé

- Délka
- „tvrdost“ spektra (ale když se porovná „začátek“ dlouhých s krátkými, vyjde totéž)
- Lag
- Charakter galaxie
- Rudý posuv
- Celkový výkon

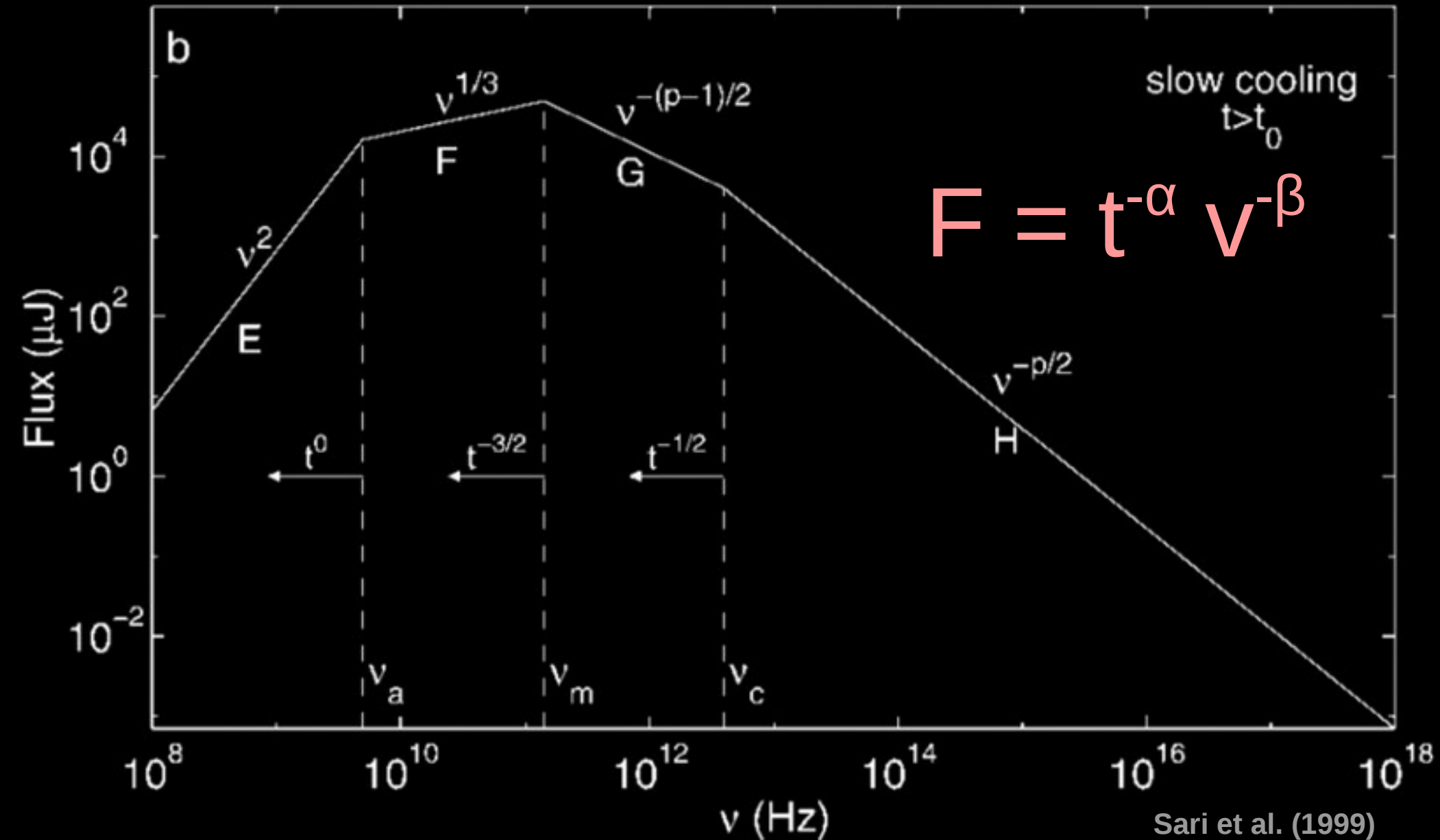
AMATIHO VZTAH



JET, KOLIMACE, RELATIVITA



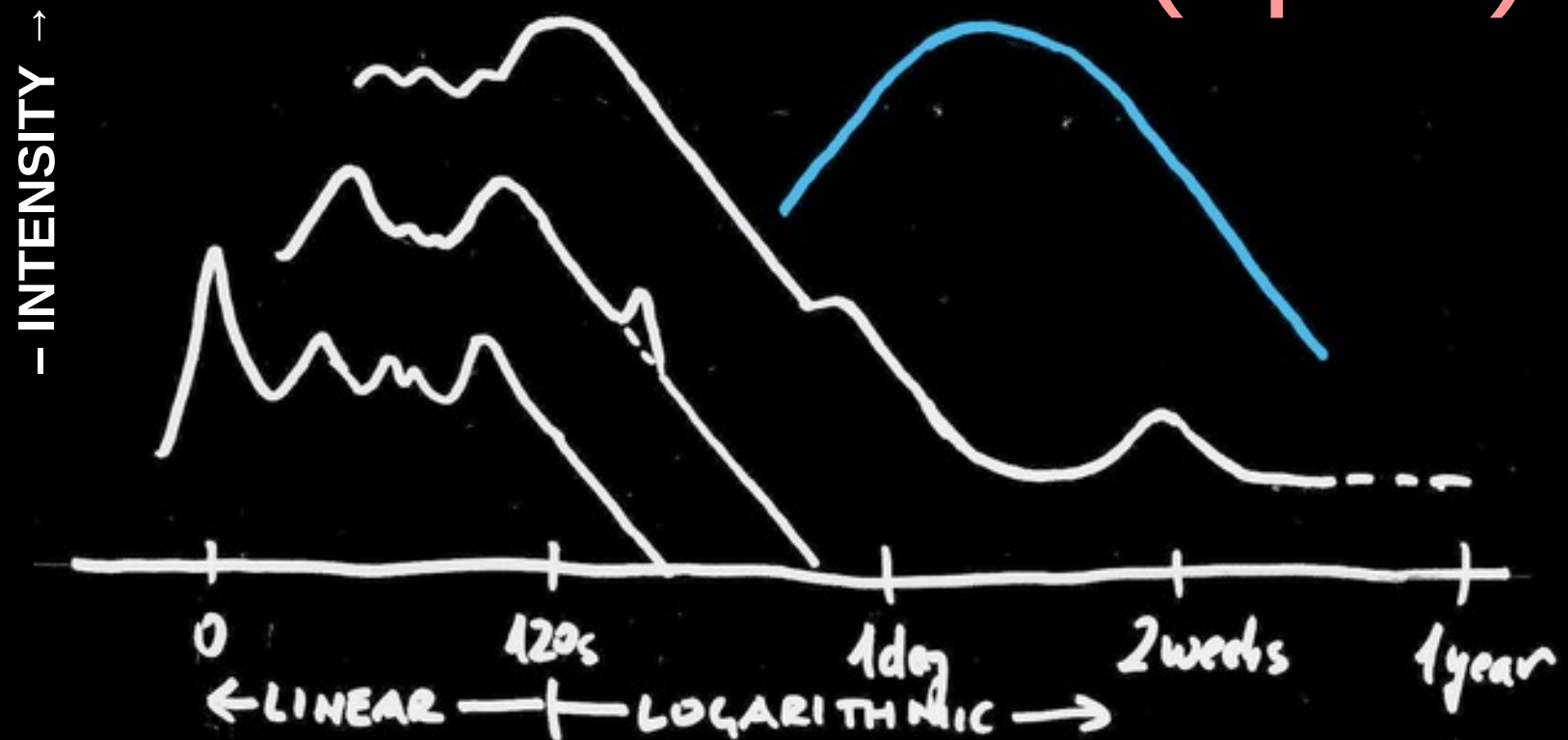
I. GAMMA-RAY BURSTS



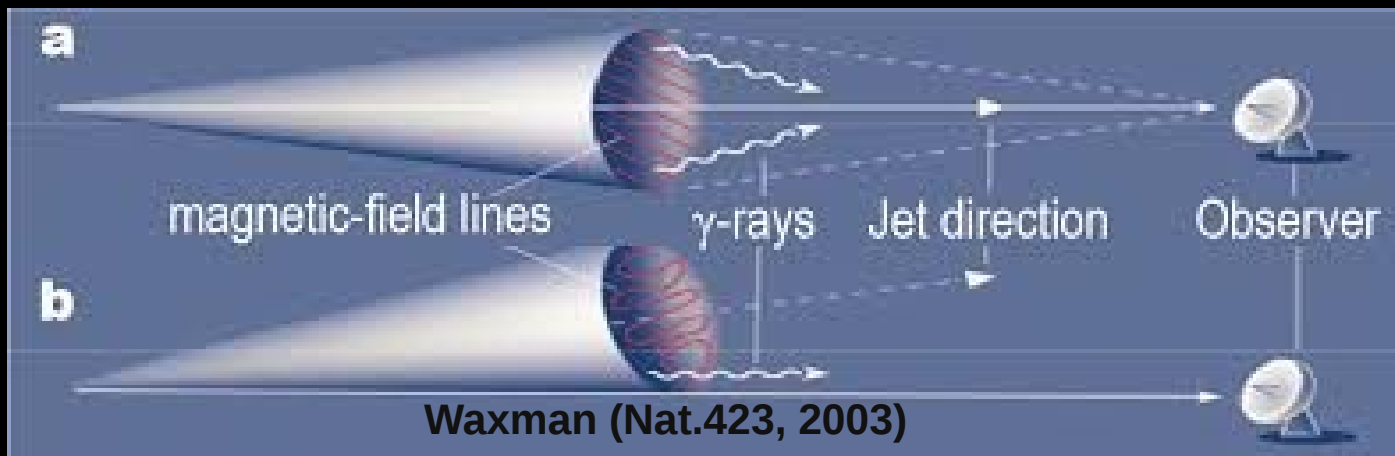
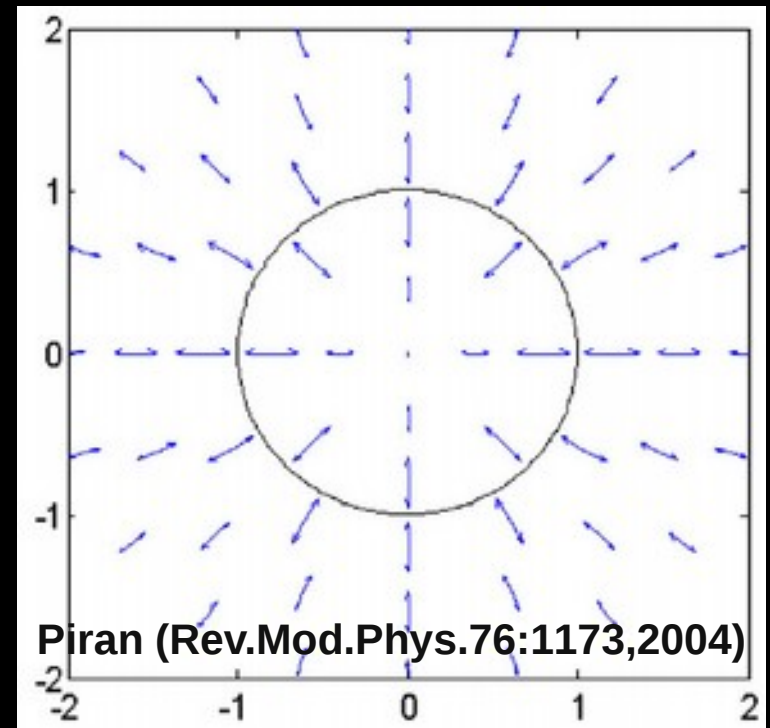
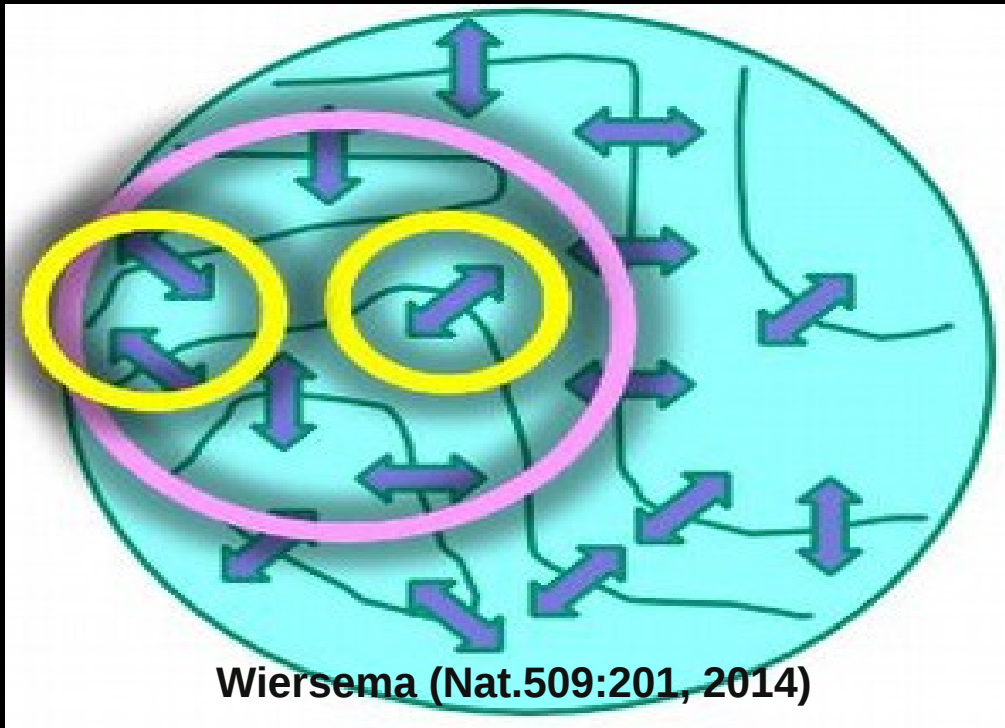
SVĚTELNÁ KŘIVKA

$$F = t^{-\alpha} v^{-\beta}$$

$$\alpha = (3p - k)/4$$



POLARIZACE



GRB-SN relation

- SN-Ic = „hypernova“, kolapsar
- „kilonova“ = zjasnění pozorované posud u 2 krátkých GRBů
- => progenitor = rychle rotující * s malou metalicitou a hmotností řádově 50 M(sun)

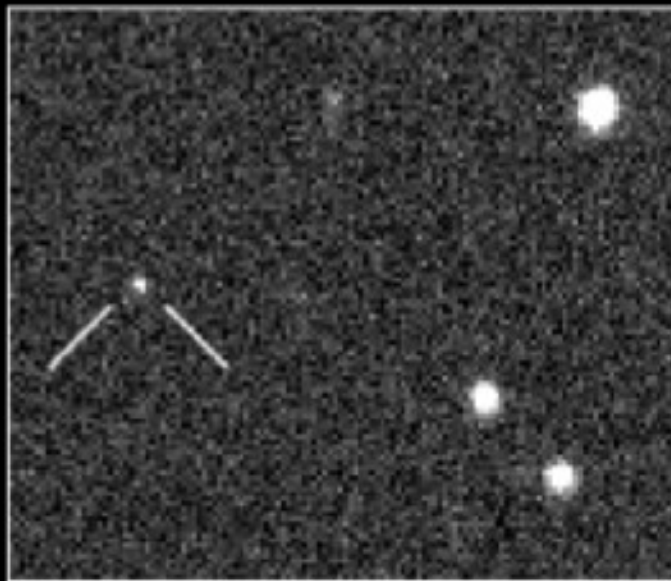
GRB jako nástroj

- Kosmologie: ($z_{\text{max}} = \sim 9$)
 - Std. Svíce, pokusy o kalibraci
 - „tomografie“ vesmíru
 - Stopa historie formování hvězd
- Výběr galaxií, statistika

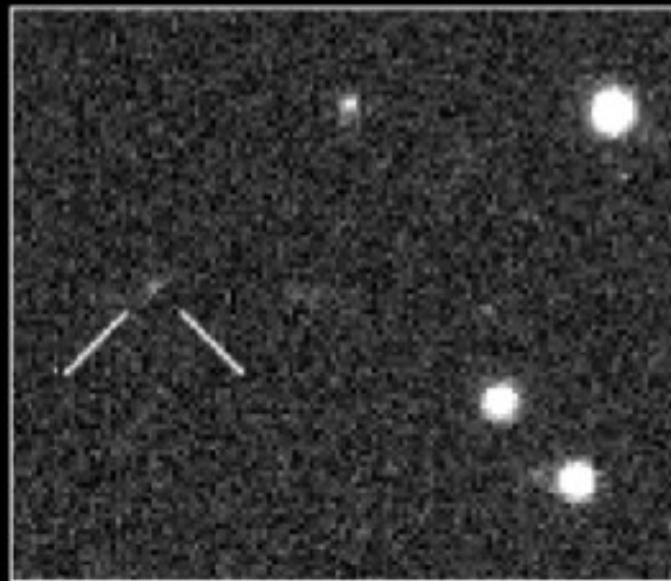


GRB 060117

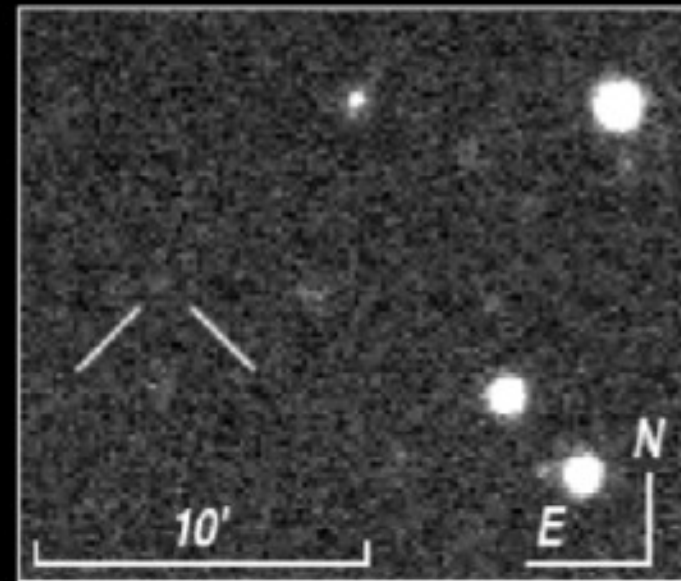
FRAM WF (D=72mm)



T0+2min

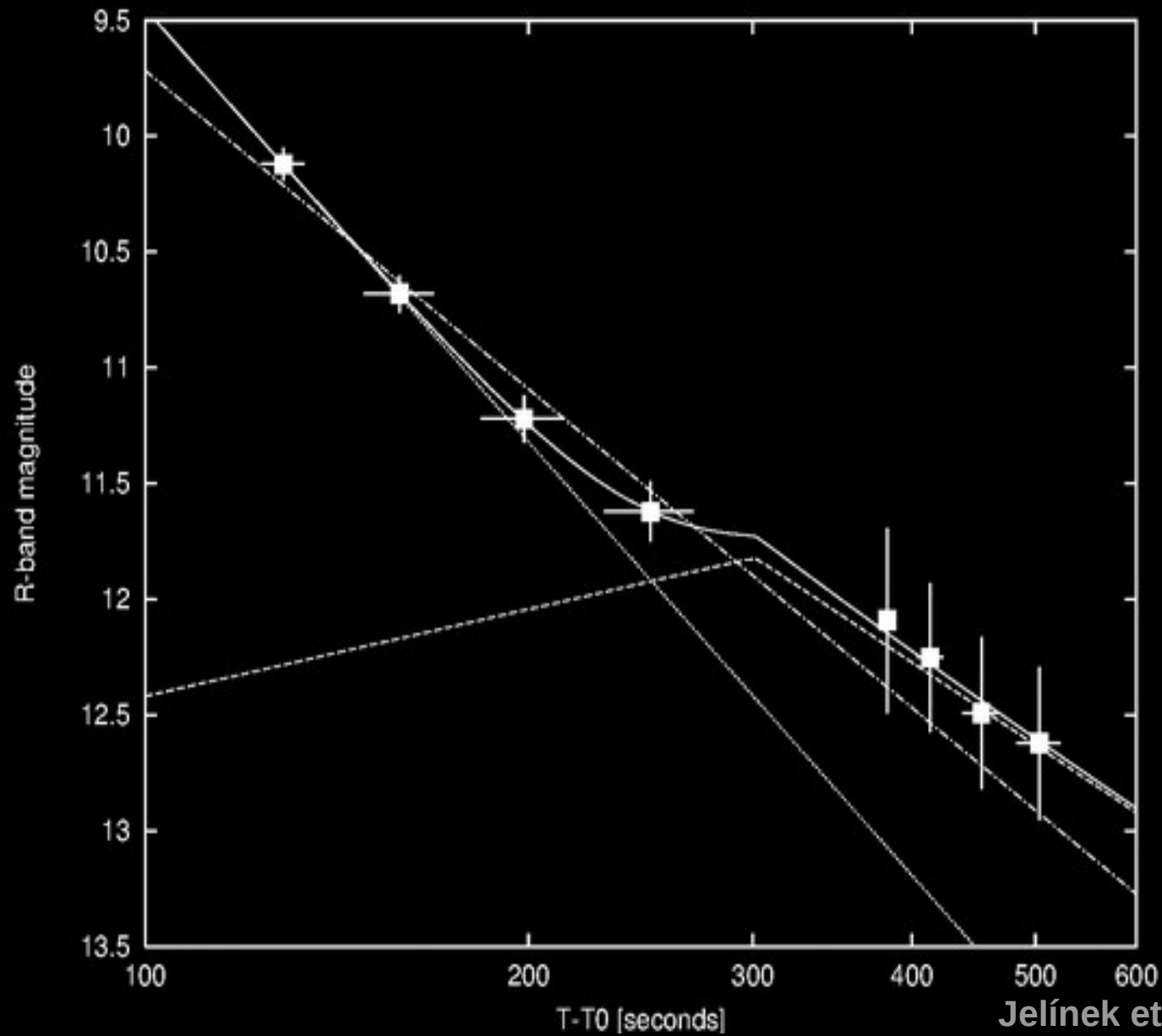


T0+4min



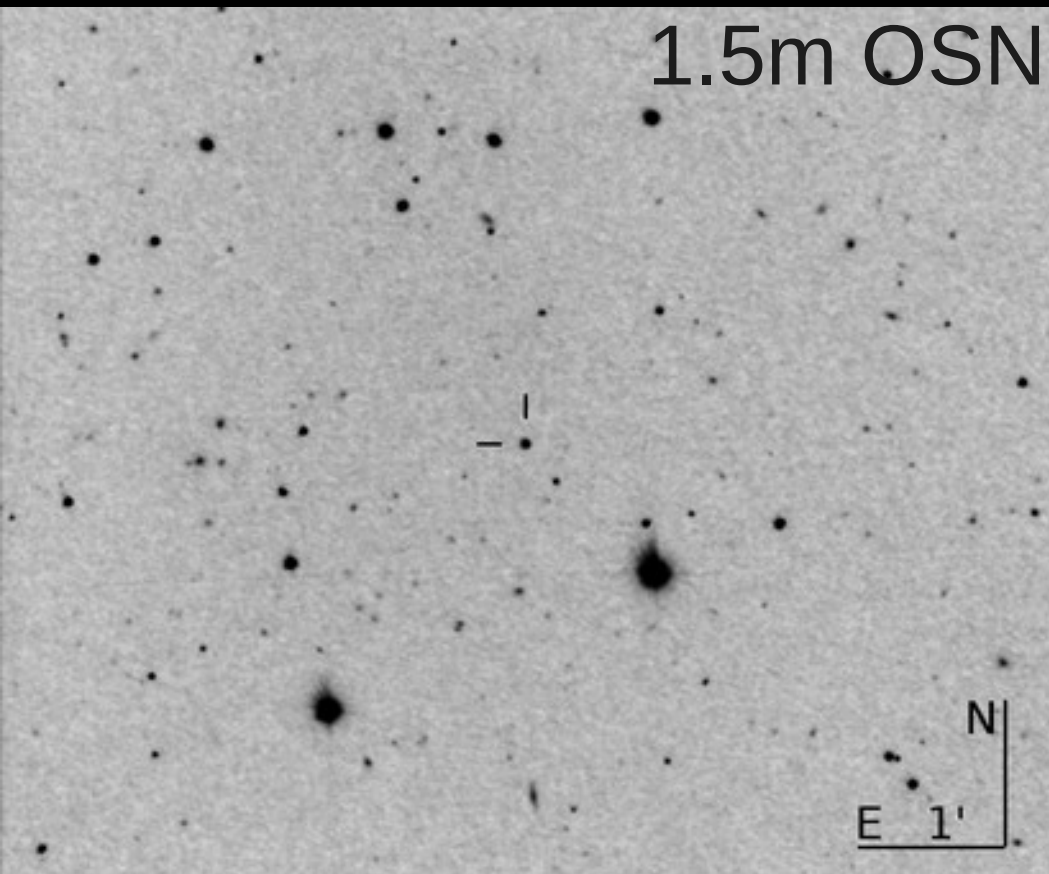
T0+8min

III. GRB 060117

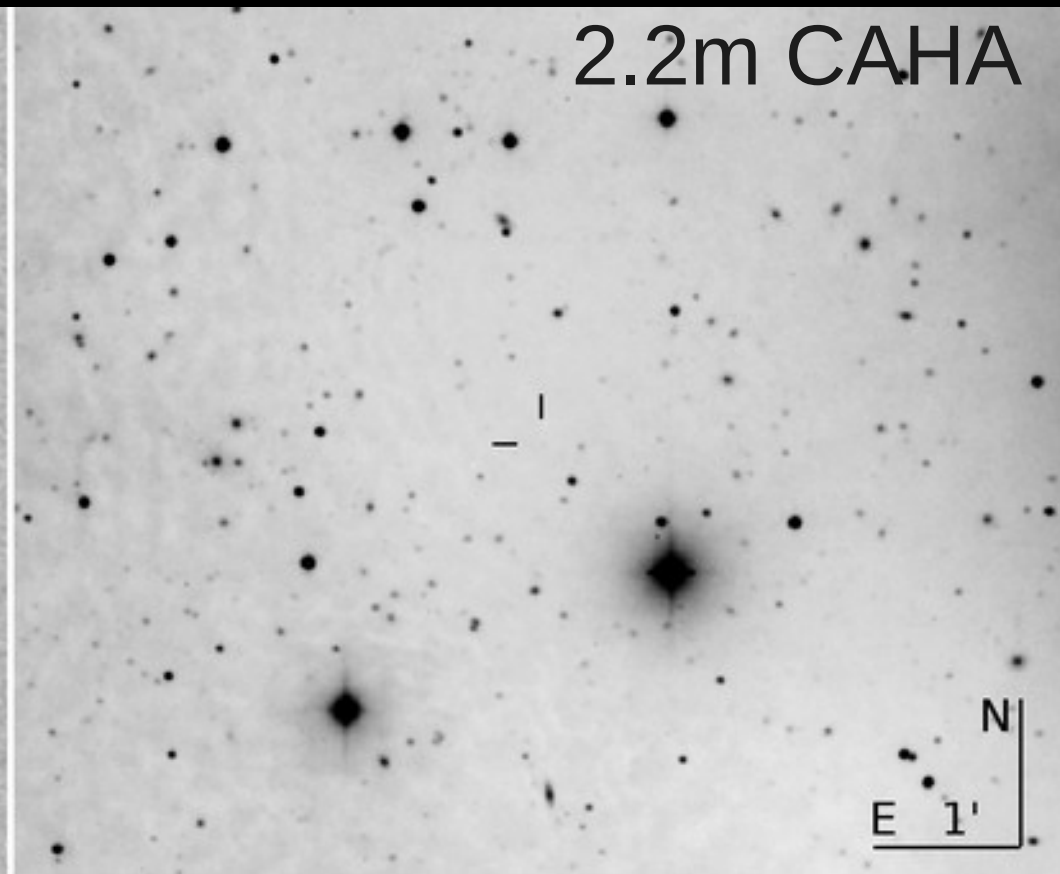


Jelínek et al. (2006)

GRB 060904B

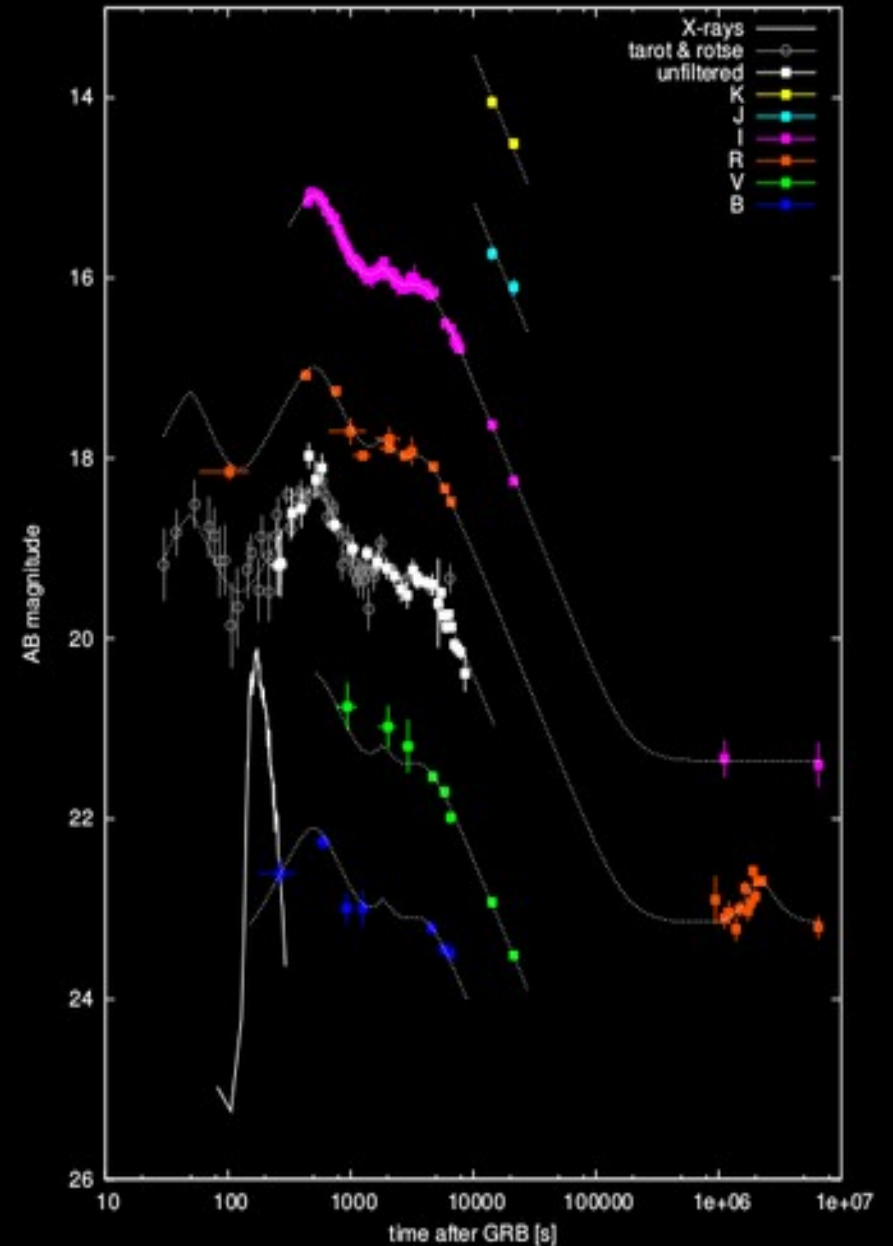
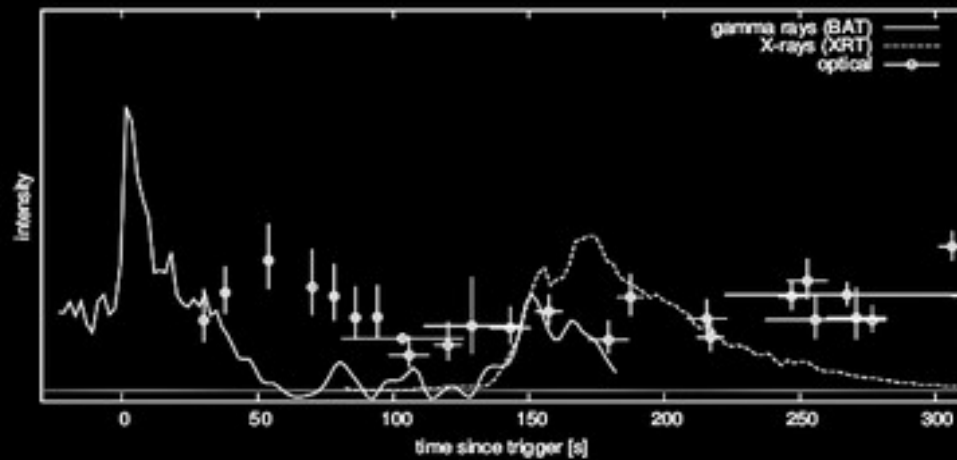


T0 + 8 min

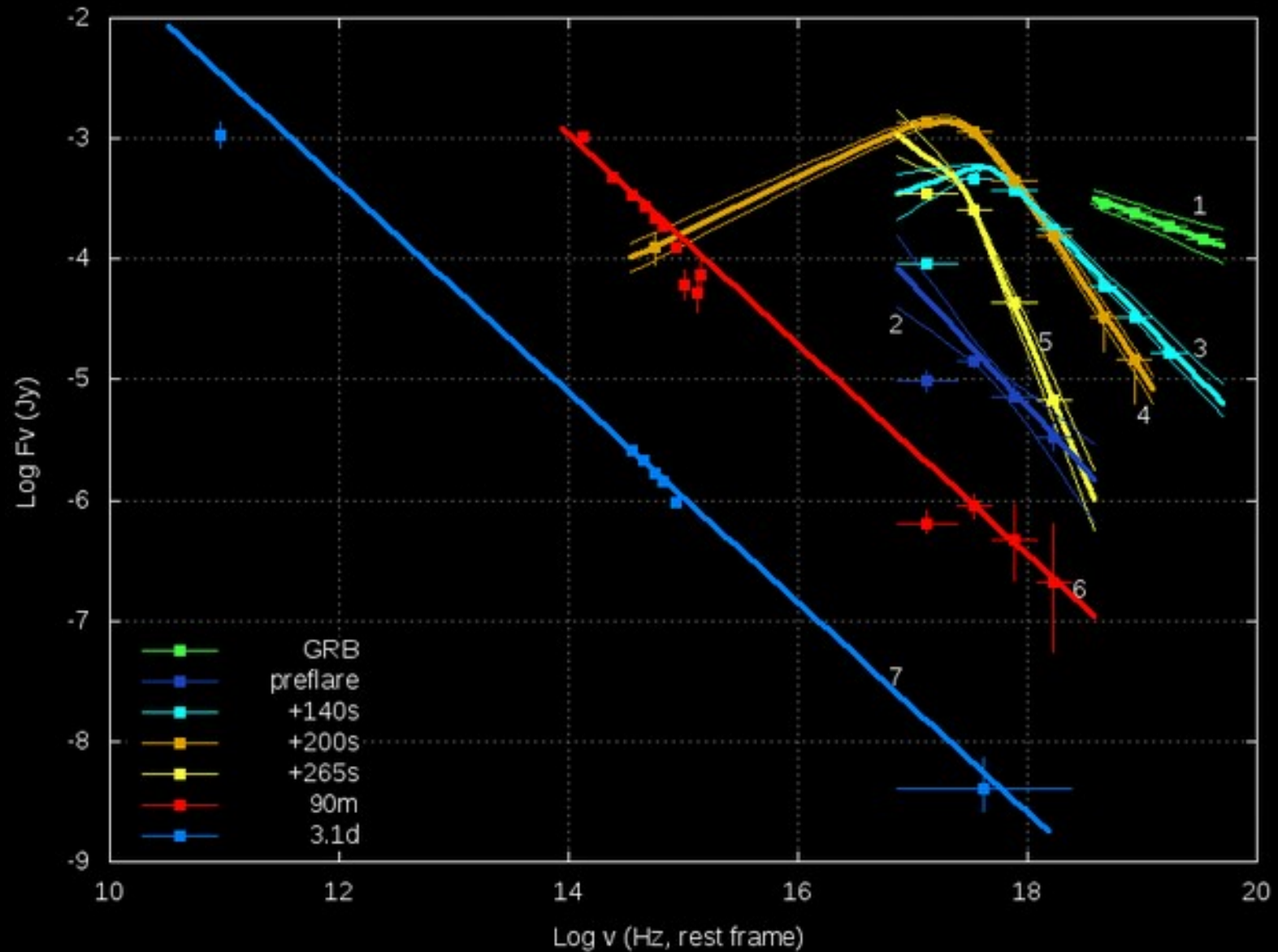


T0 + 1 month

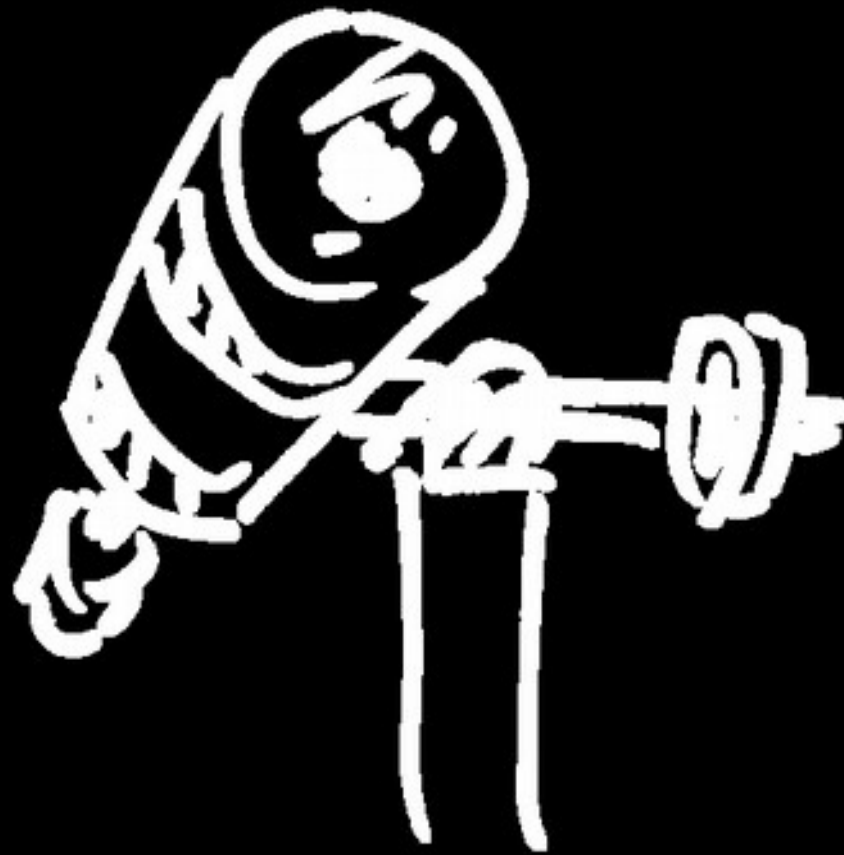
IV. GRB 060904B



IV. GRB 060904B



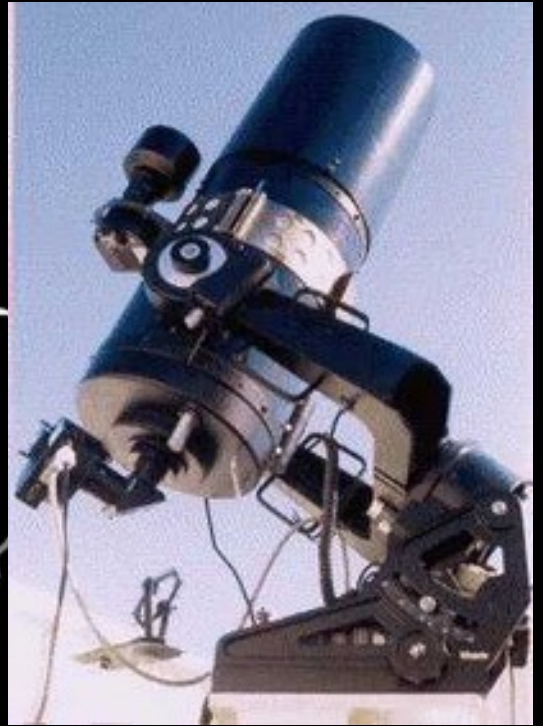
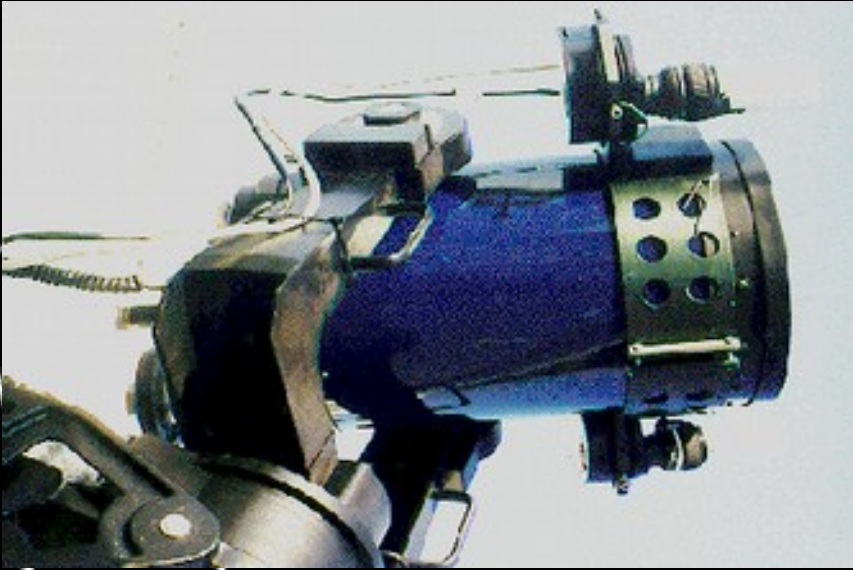
VIII. BOOTES



VIII. BOOTES: network



VIII. BOOTES: network



VIII. BOOTES: B-IR

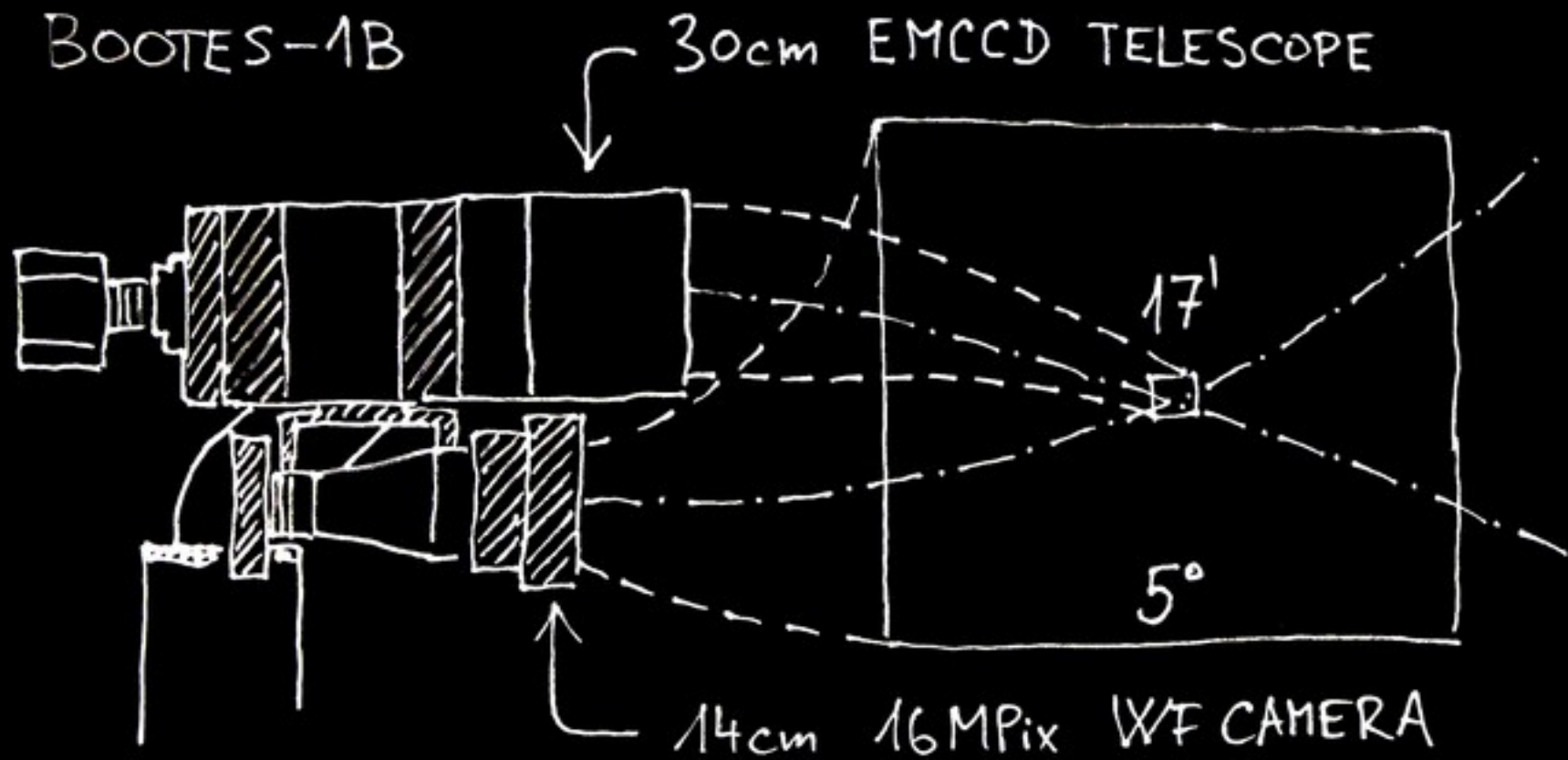
BOOTES-IR (TGO@OSN)

SINCE 2004 (OPTICAL) 2008 (INFRARED)

2950 M ALTITUDE
FILTERS: Y,Z,J,H,K



VIII. BOOTES-1



VIII. BOOTES-1A



VIII. BOOTES-1B



VIII. BOOTES-1



VIII. BOOTES-2

10x10° FIELD
OF VIEW →

FAST-SLEWING
MOUNT →

AUTOMATED DATA
PROCESSING →

RTS-2 →



60 CM PRIMARY
↙

SDSS FILTERS
↙

EM CCD (ANDOR)
↙

WEATHER SENSING
↙

SUPPORT: ALL-SKY CAMERA
CLOUD SENSOR
WEATHER STATION

VIII. BOOTES-2

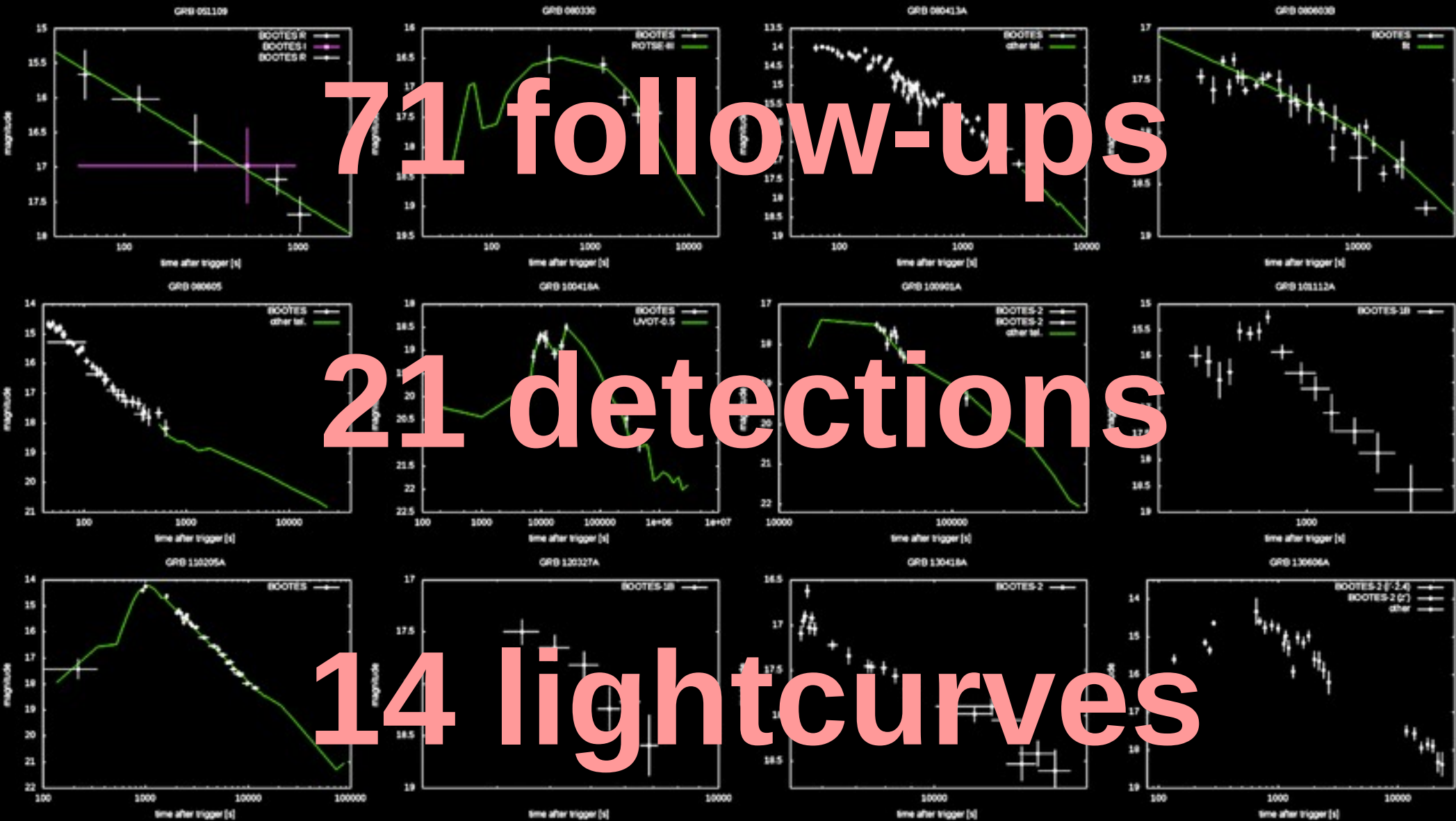


VIII. BOOTES: GRB observations

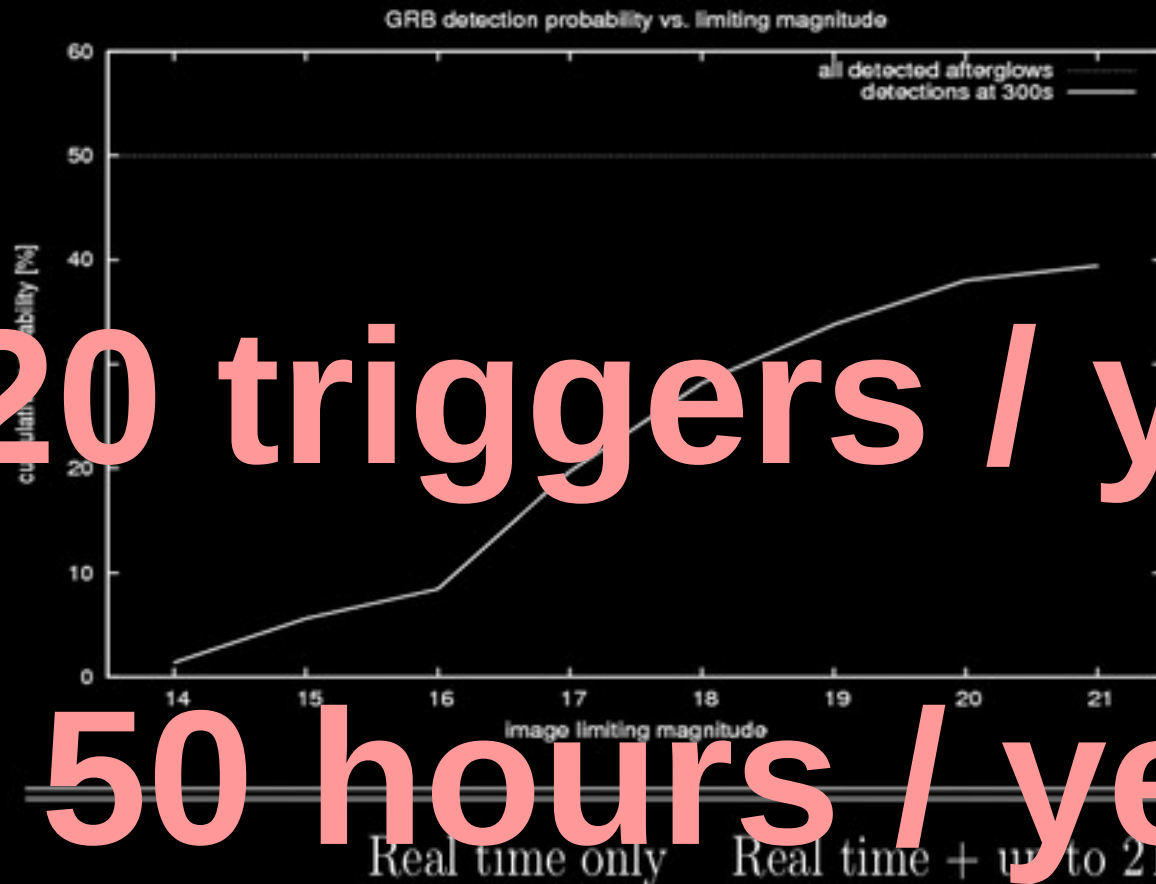
71 follow-ups

21 detections

14 lightcurves



VIII. BOOTES: Trigger statistics

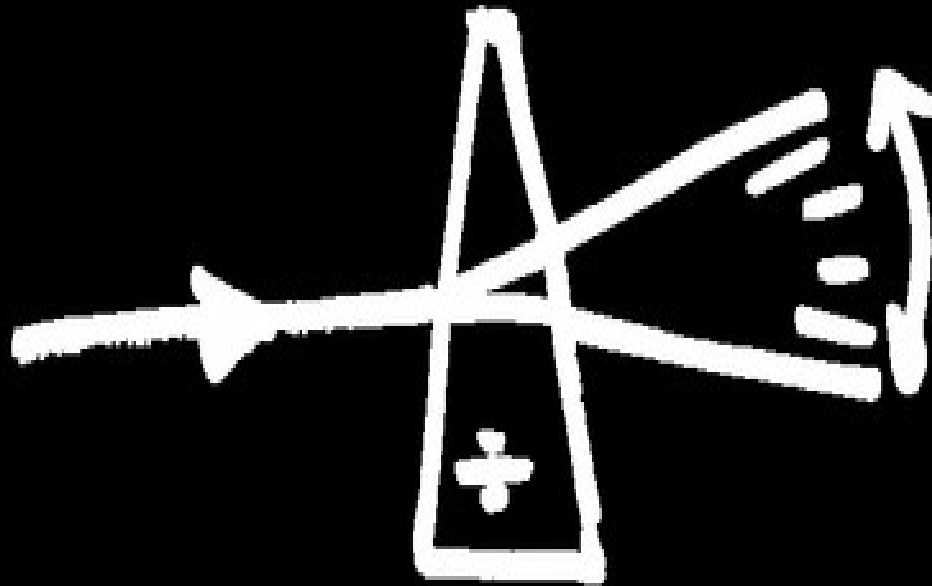


~ 20 triggers / year

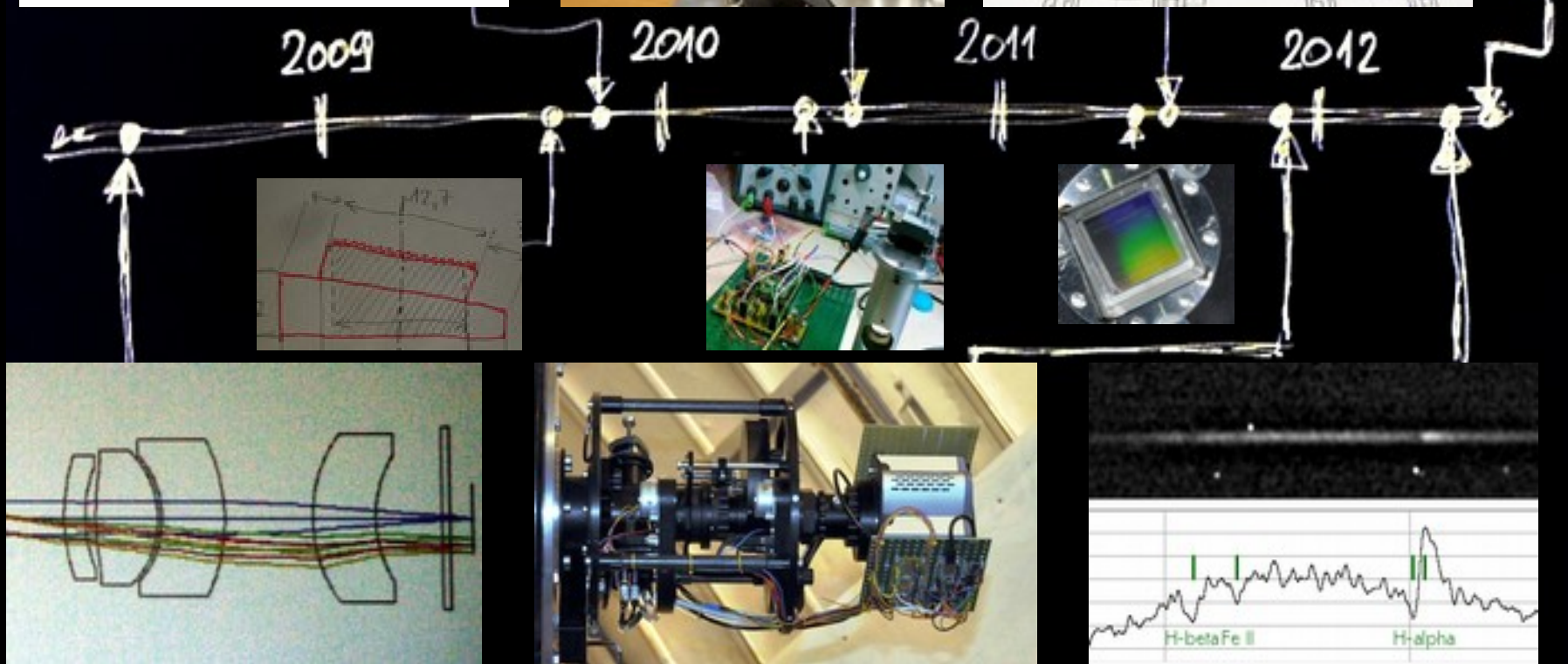
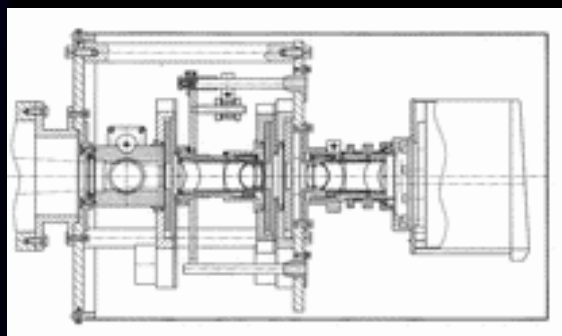
~ 50 hours / year

triggers/year	18	22
hours/year	50.5	78.5
hours/trigger	2.8	3.5
days/trigger	20.3	16.6

IX. COLORES



IX. COLORES



F/8 OPTICS

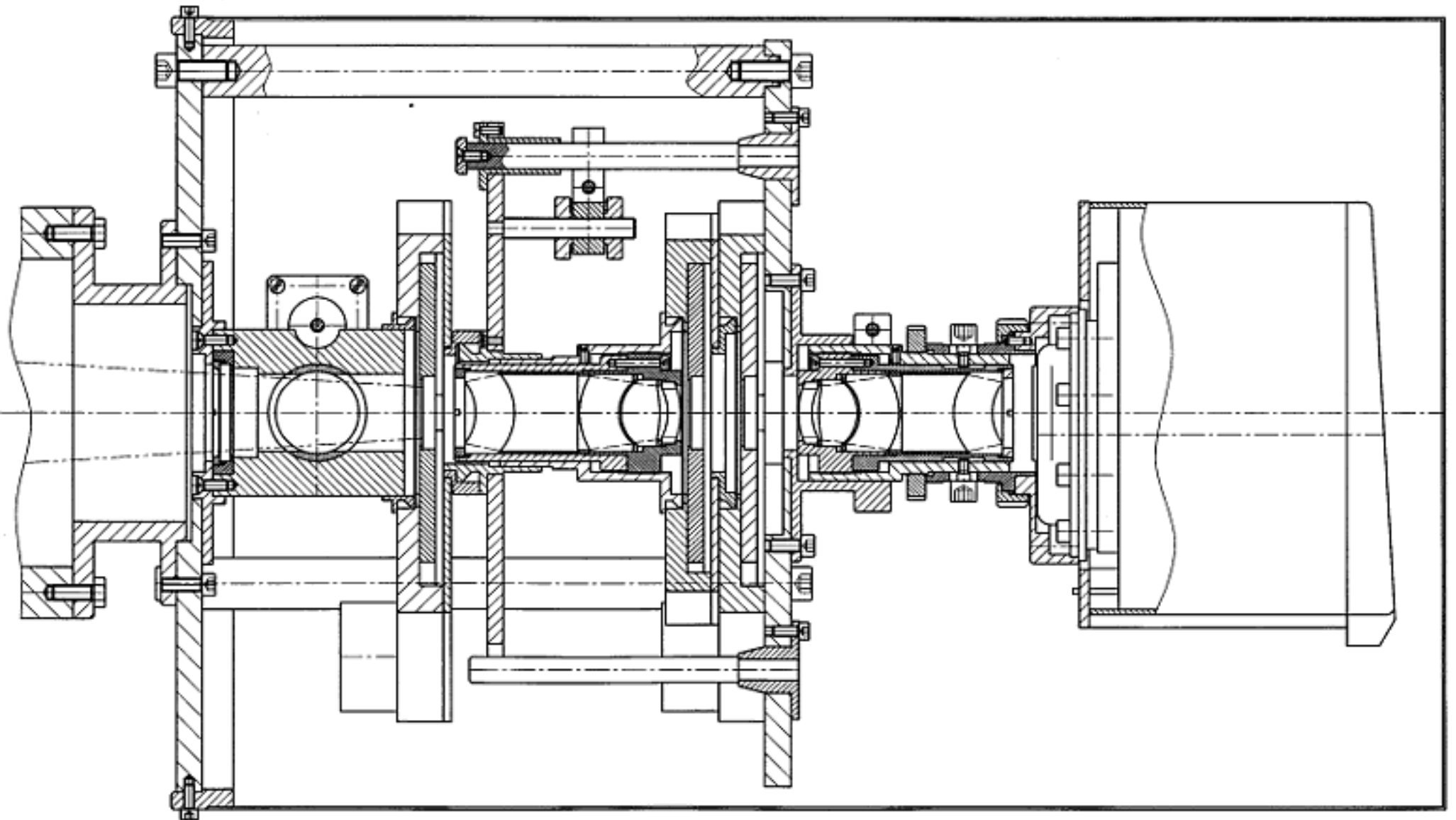
FOSC DESIGN



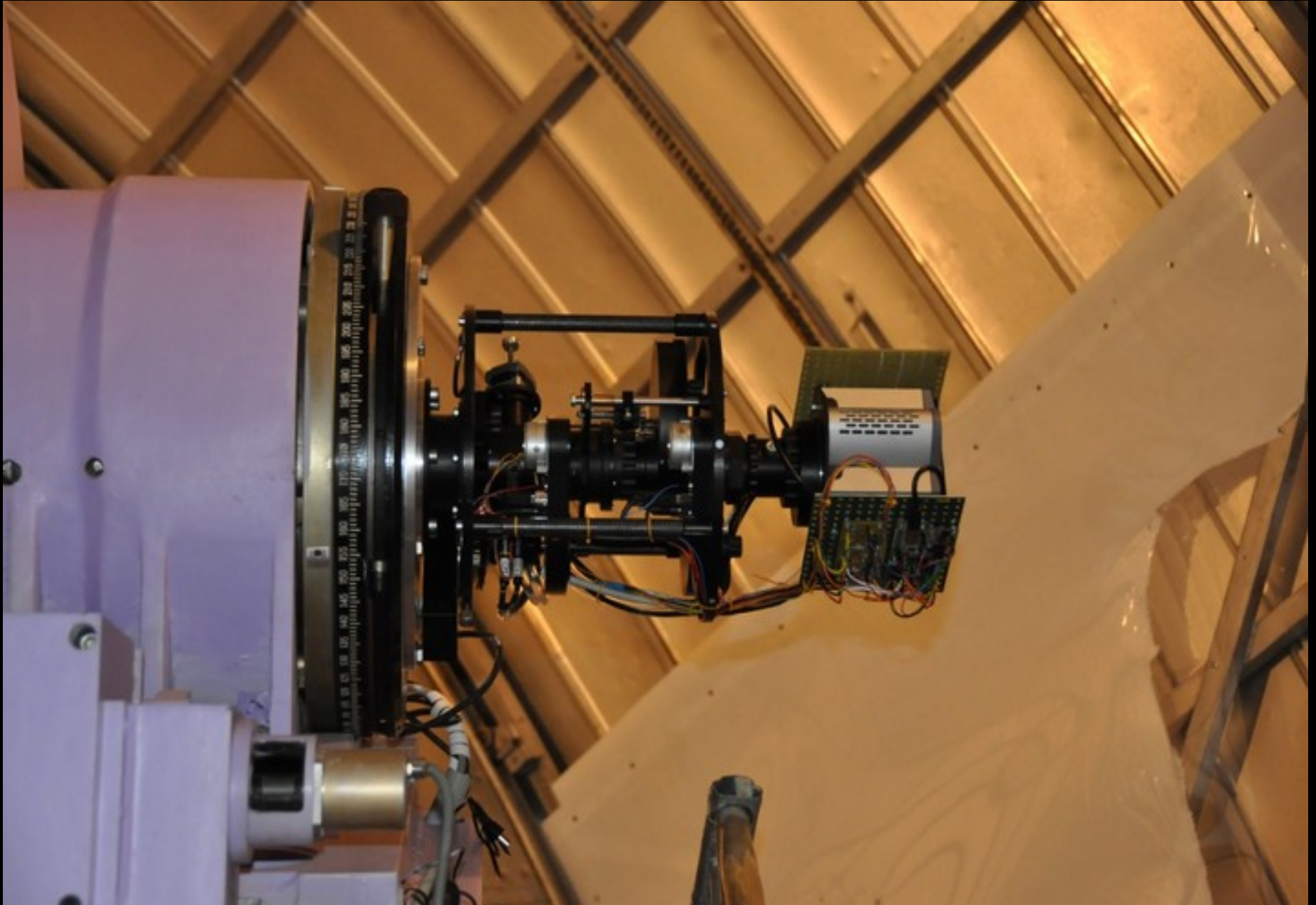
ANDOR EM-CCD

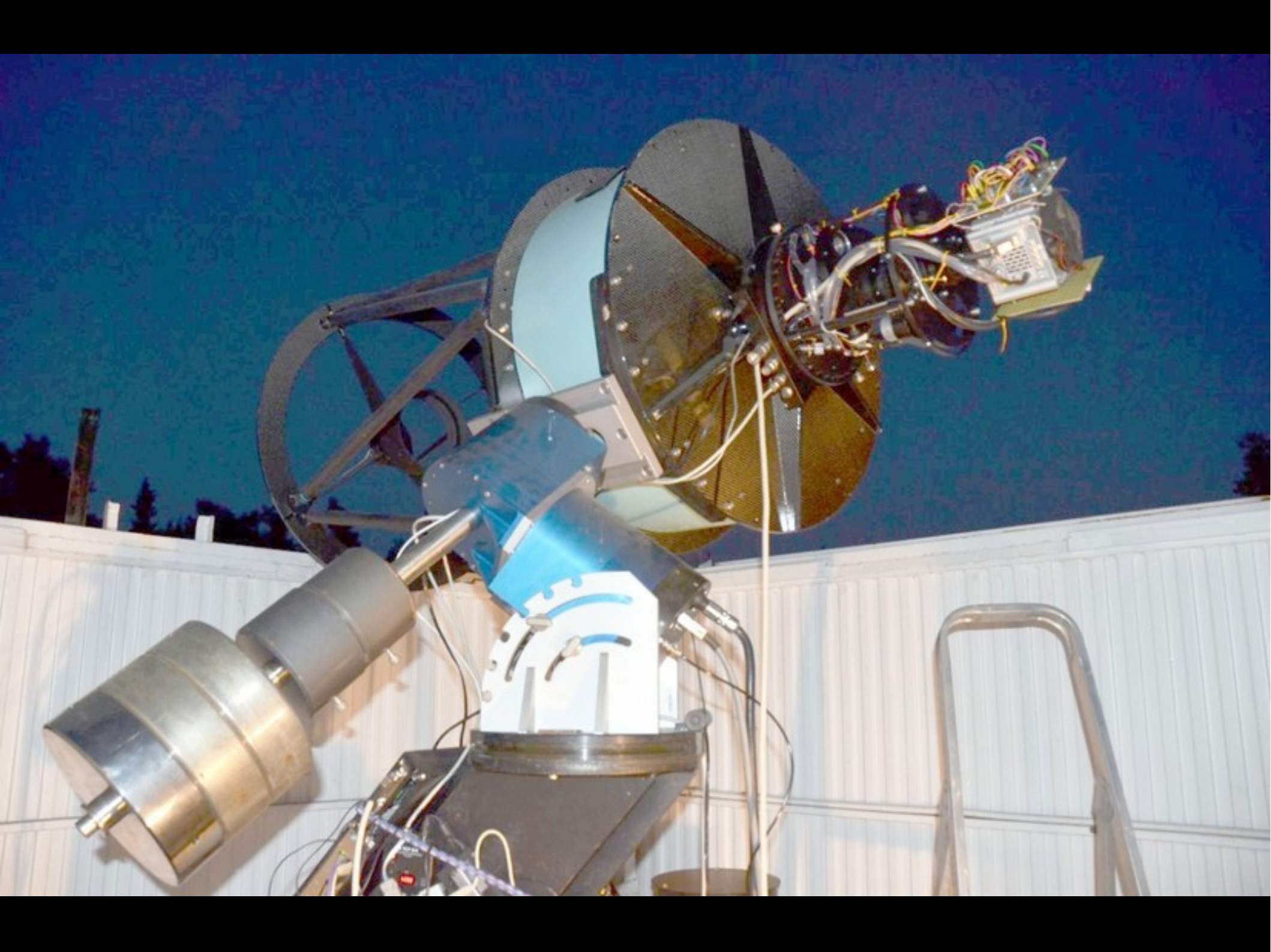
AUTOMATED OPERATION

IX. COLORES: schematic



IX. COLORES: finished





IX. COLORES: parameters

Parameter	Value
focal ratio	f/8
CCD resolution	1024×1024, 13 μm
CCD pixel scale	0.56''
field of view	10' × 10'
magnitude limit	R>18 mag in 60 s
spectral scale	7.8 Å/pixel
slits	25/50/75/100 μm
dispersion ($\lambda/\delta\lambda$)	400/200/150/100 @ 6000 Å
spectral resolution	15/30/45/60 Å
wavelength range	3800 – 11500 Å
magnitude limit	15.5 mag in 300 s
spectrograph weight	12 kg
seeing at BOOTES-2	2'' in 50%, 3'' in 90%

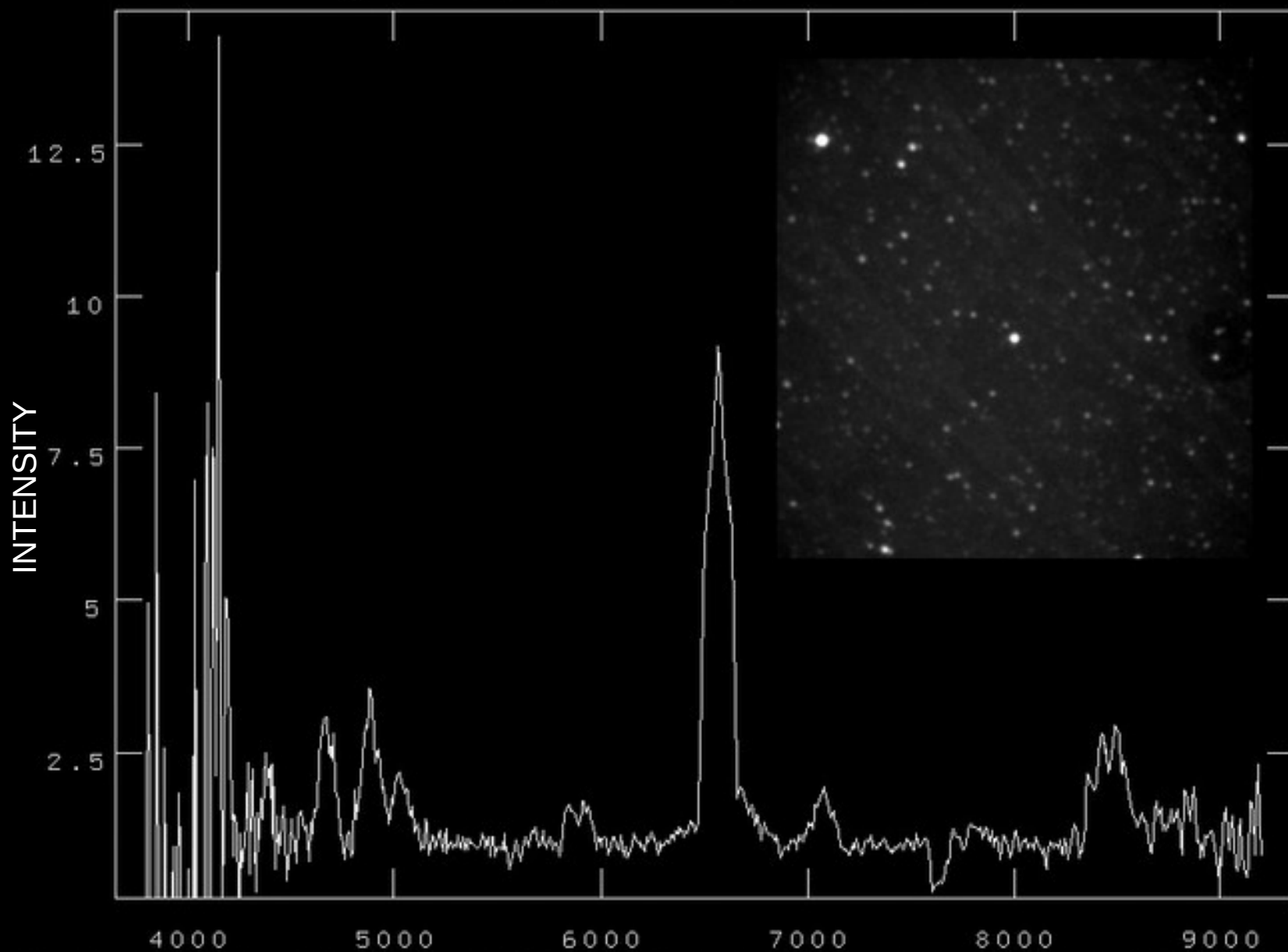
IX. COLORES: imaging w/o spectroscopy



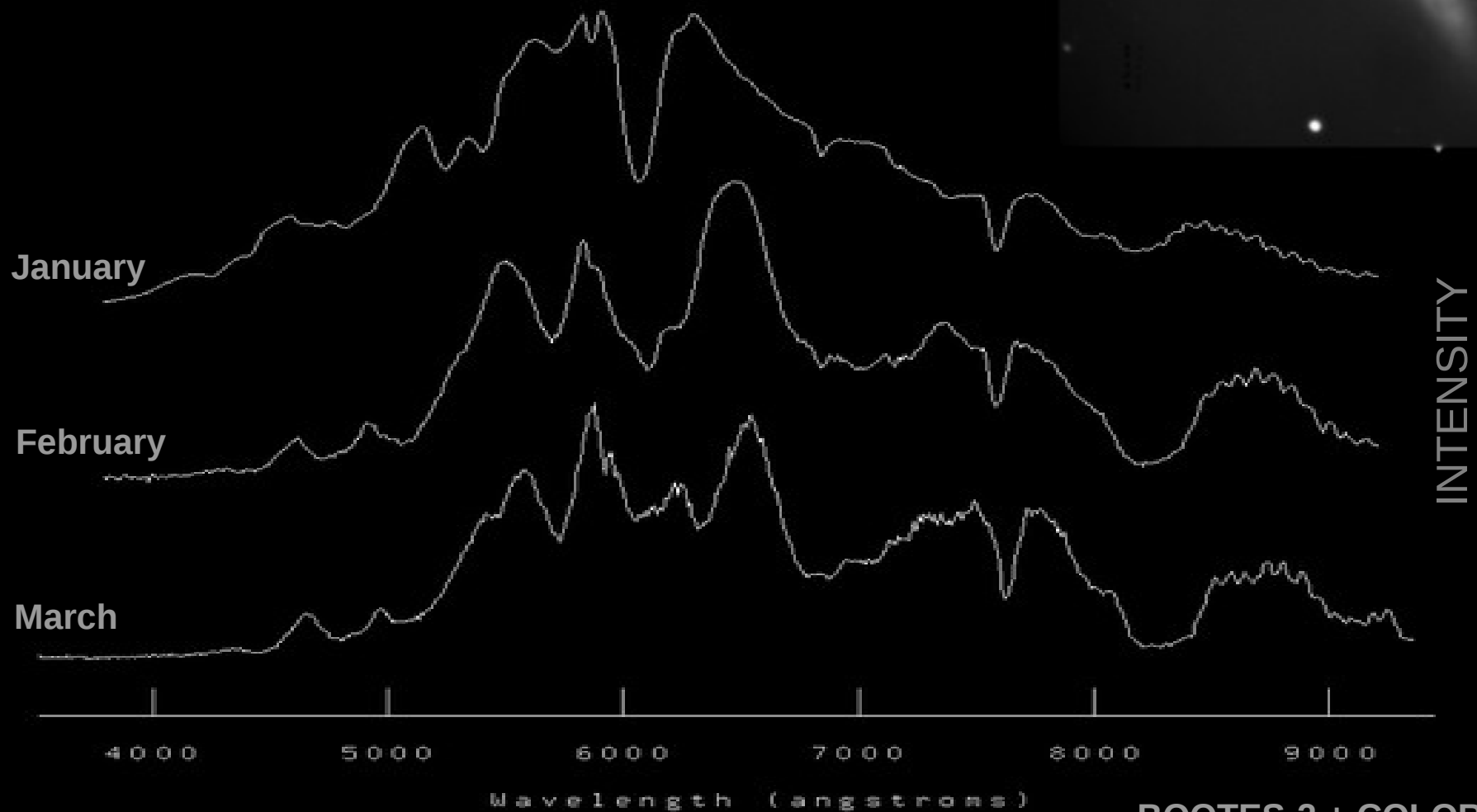
BOOTES-2 + COLORES

IX. COLORES: N Sco 2014

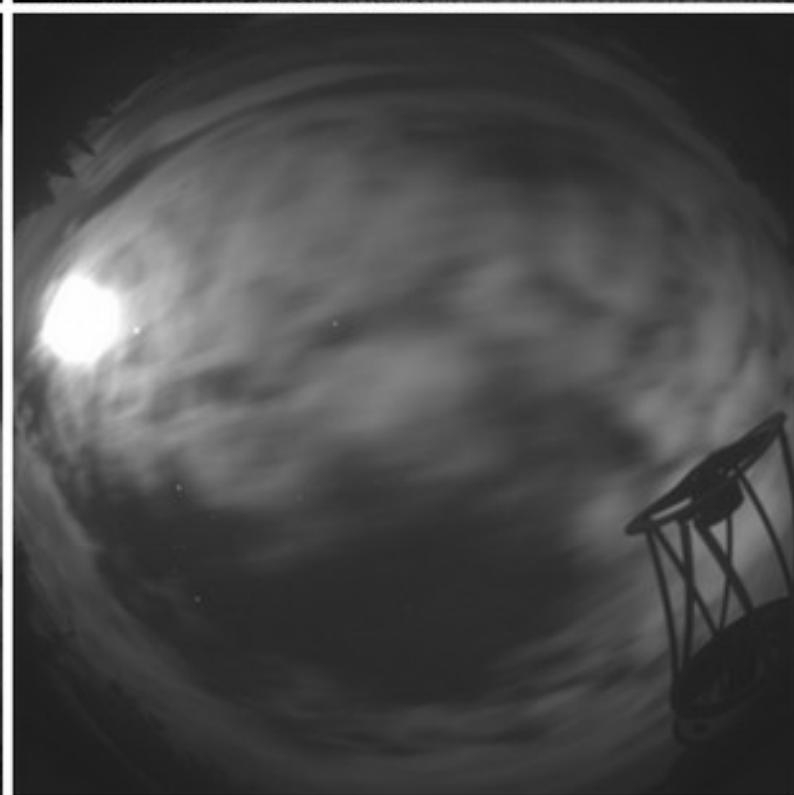
Nova Scorpii 2014, spectrum by BOOTES-2 + COLORES



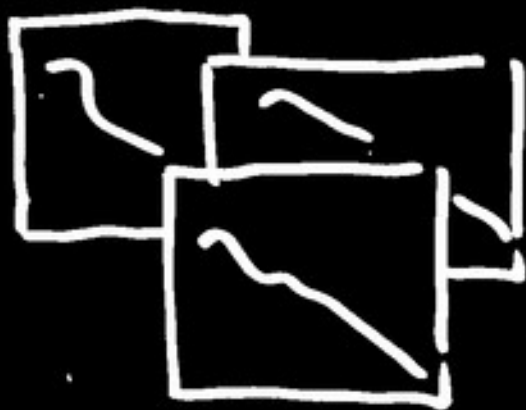
IX. COLORES: sn2014J



IX. COLORES - ISON



JEŠTĚ JEDNOU



GRB NOT TO SCALE →

KONEC, HURÁ