Future Observational Facilities

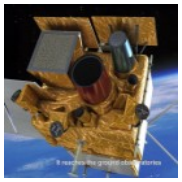
Discussion by Alain KLOTZ

KILONOVA CATCHER

Which telescope for which observation domain ?

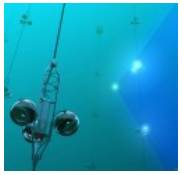
"Early"
Fast pointing (robotic prefered)
Short exposures

"Late" = follow-up
Pointing from 0.1 to 5 days
Long exposures



Searching
an optical counterpart of a
GRB Swift or SVOM alert

Characterizing
a GRB
candidate



Searching
an optical counterpart of a
neutrino alert

?

Searching
a kilonova in a BNS
credible GW region

Characterizing
a kilonova
candidate

Field of view 1 to 10°
Filter clear
photometry at 0.5 mag

Field of view 10' to 30'
Filter clear
photometry at 0.5 mag

Field of view 1' to 15'
Filter clear or grJHK
Photometry at 0.2 mag
Spectro mag 19-22

Field of view 1' to 15'
Filter clear griJHK
photometry at 0.05 mag
Spectro mag 19-22

TAROT
FRAM
OAJ

0.5 to 1m telescopes

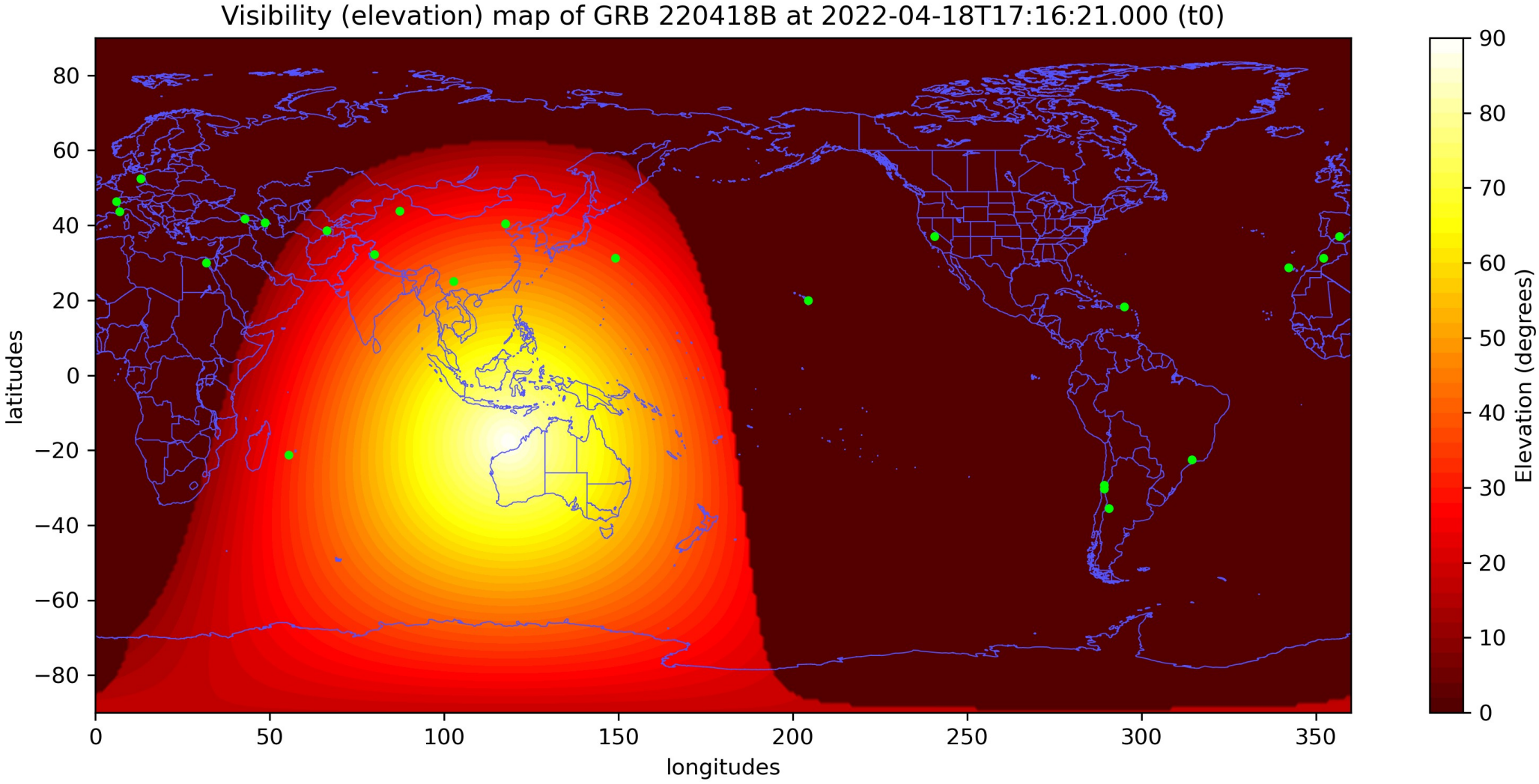
Meter telescopes : Many in GRANDMA
Spectro : CFHT, VLT, GTC
KiloNovaCatcher : > 0.3 m

Observational facilities for "early"

Why a network ?
Events are not always cooperative

Good luck
Somewhere (here in Australia)
the event occurs at zenith during night

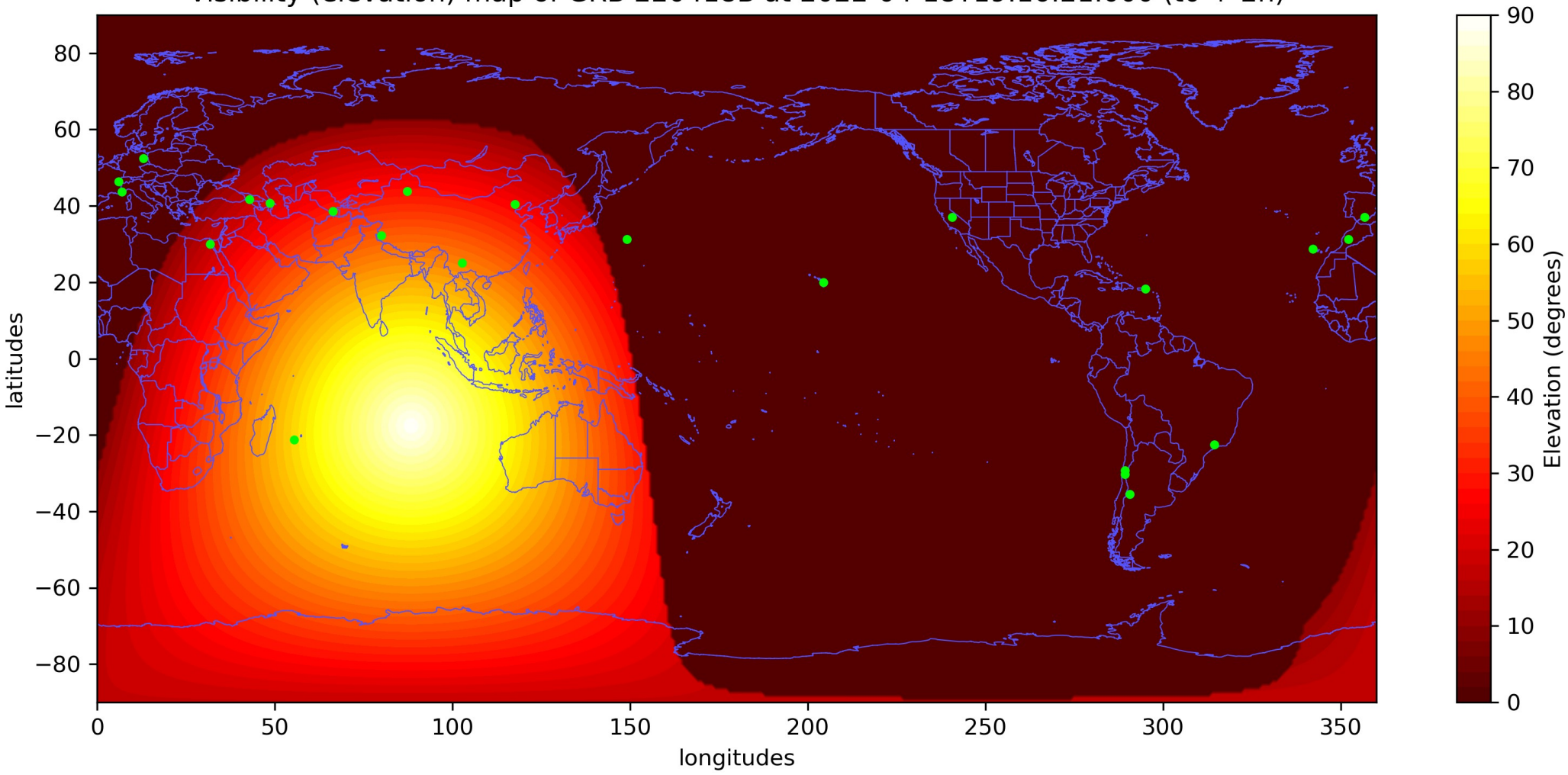
GRB 220418B (Fermi)
At time of prompt



Why a network ?
Events are not always cooperative

Good luck
Somewhere
the event occurs at zenith during night

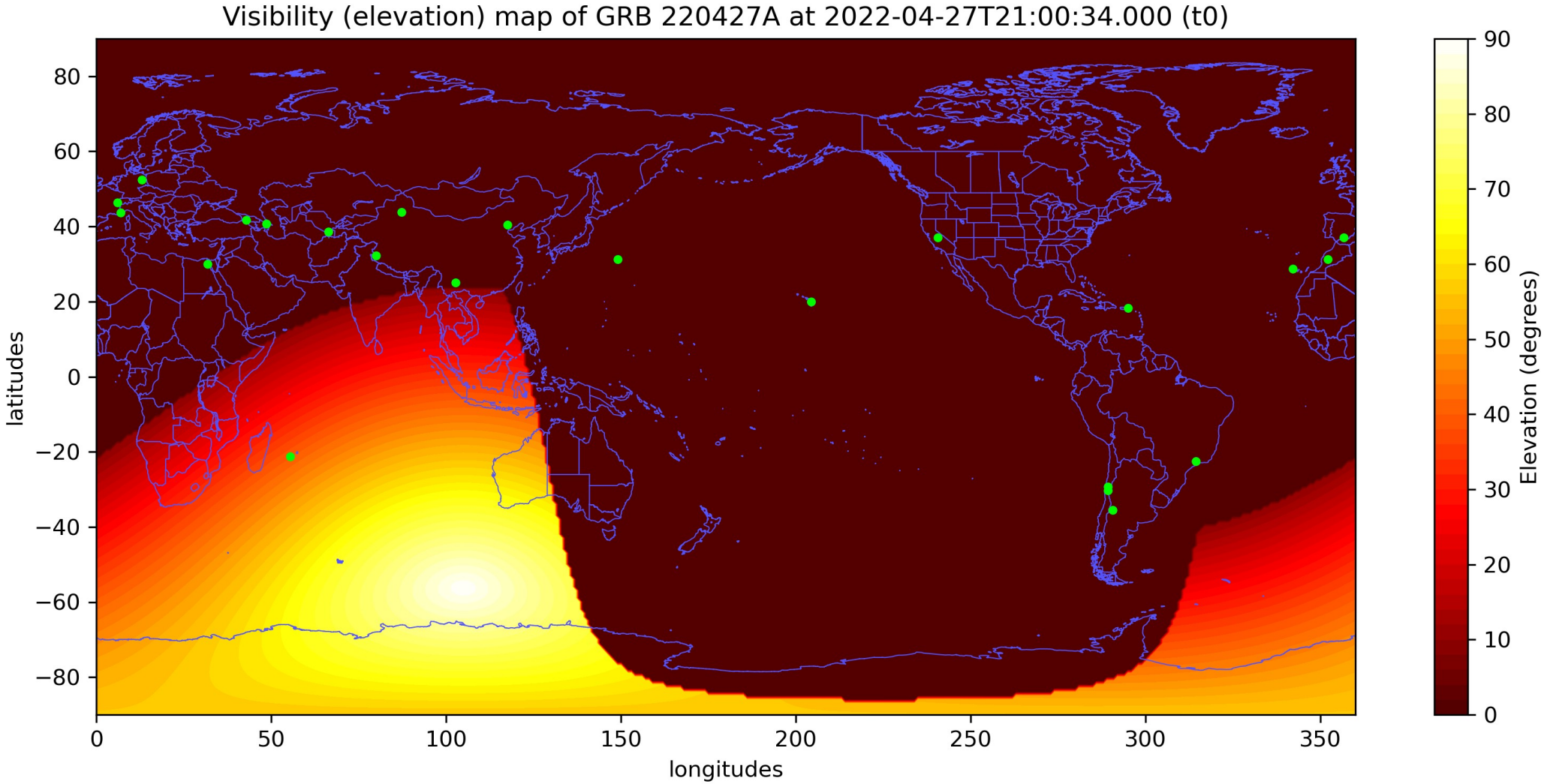
GRB 220418A (Fermi)
2 hours after prompt



Why a network ?
Events are not always cooperative

Good but frustrating
except for one GRANDMA observatory
the event occured during night.

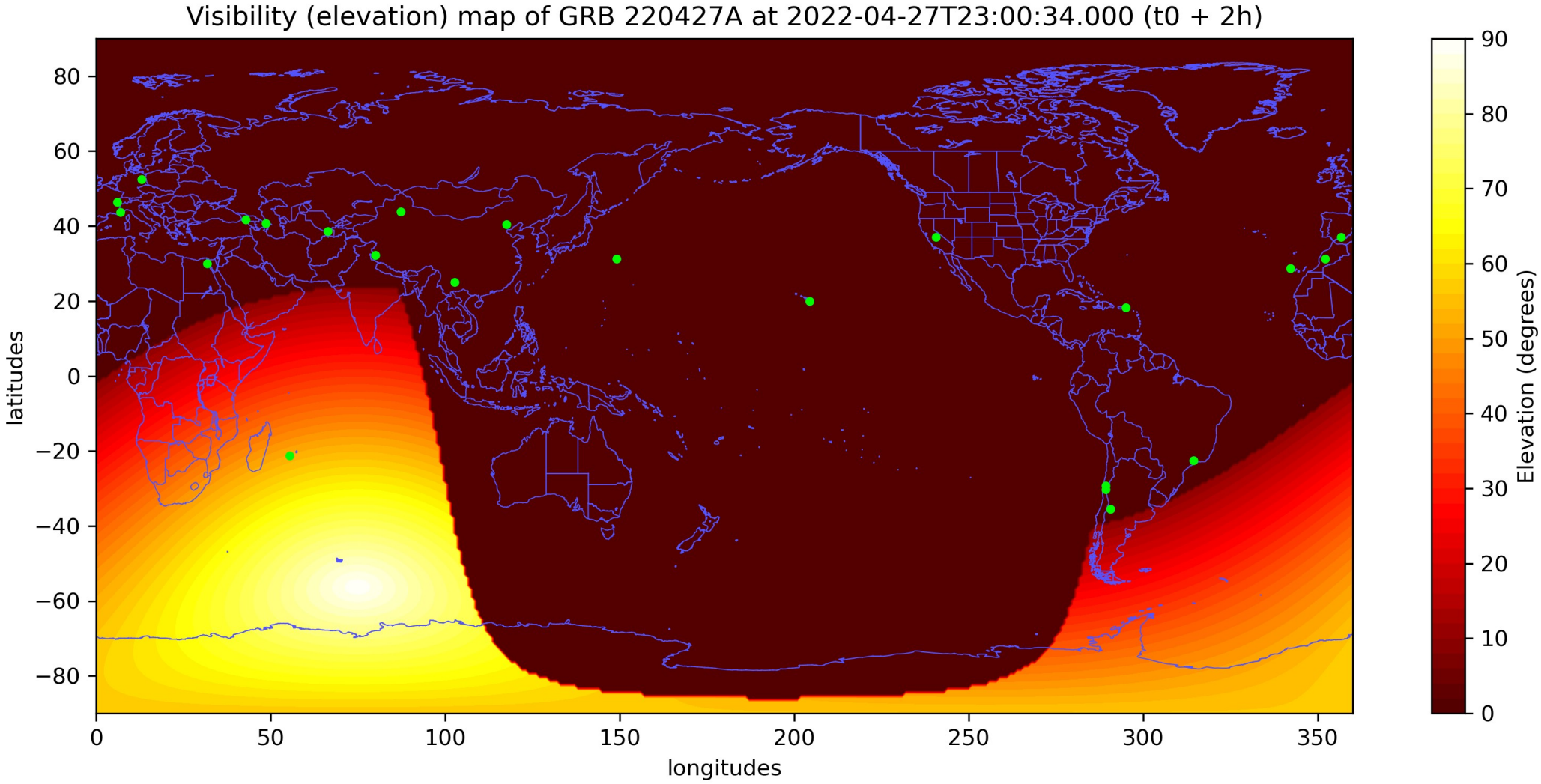
GRB 220427A (Swift)
At time of prompt



Why a network ?
Events are not always cooperative

Good but frustrating
except for one GRANDMA observatory
the event occured during night.

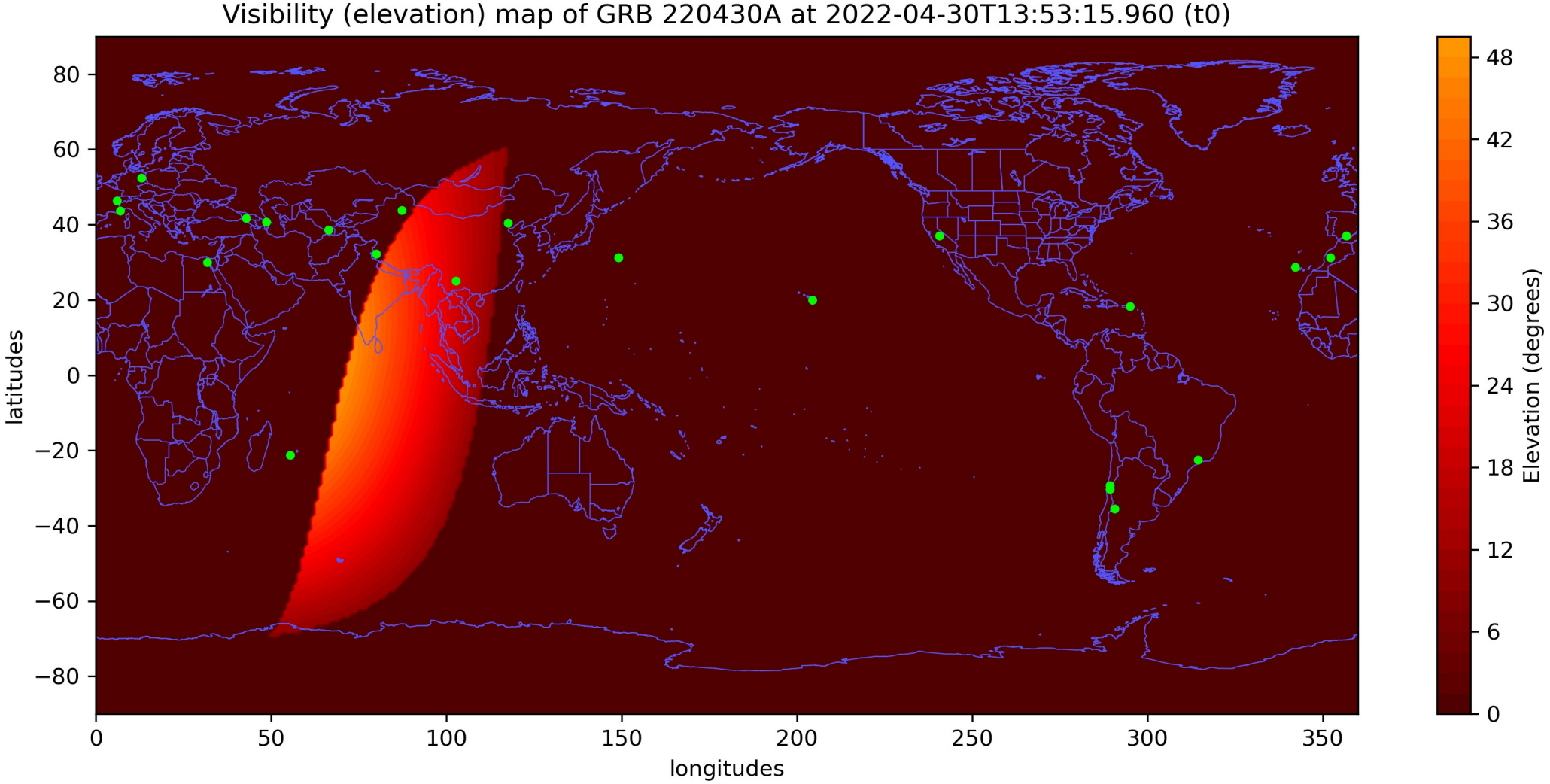
GRB 220427A (Swift)
2 hours after prompt



Why a network ?
Events are not always cooperative

Bad luck
The event occurs always anywere
at low elevation during begining of night

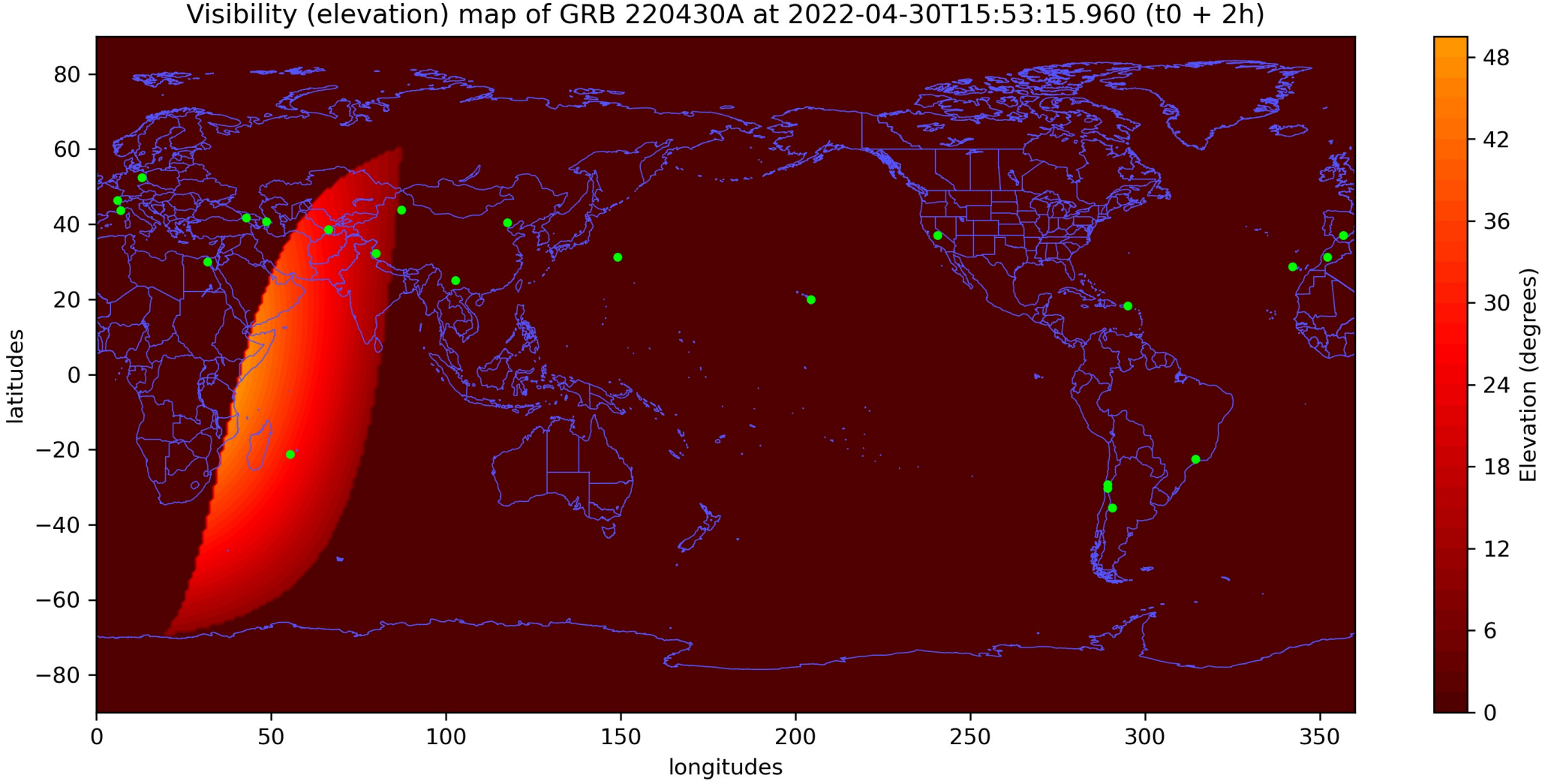
GRB 220430A (Swift)
At time of prompt



Why a network ?
Events are not always cooperative

Bad luck
The event occurs always anywere
at low elevation during begining of night

GRB 220430A (Swift)
2 hours after prompt

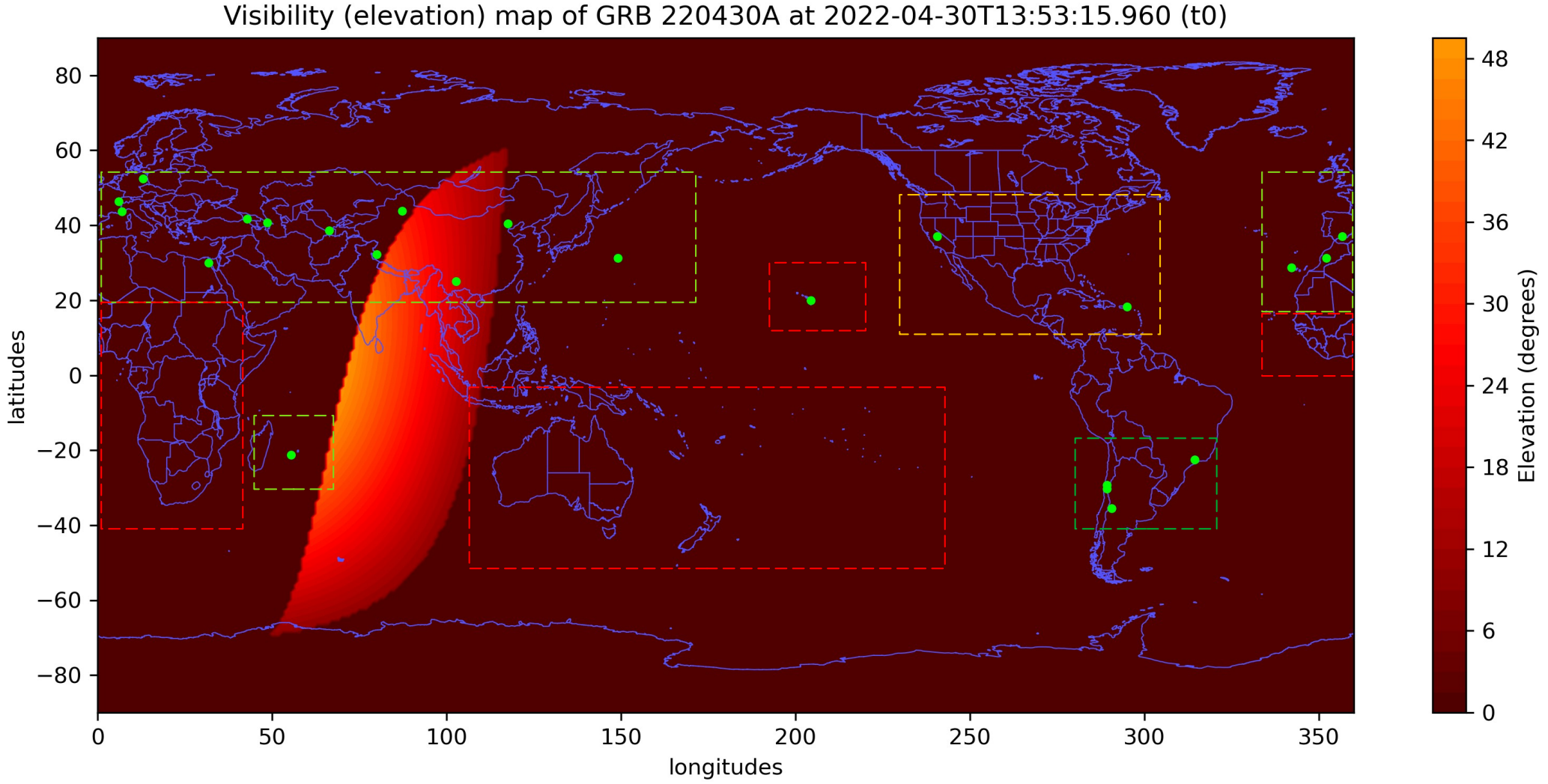


Extend the GRANDMA network

Where to put new telescopes for prompt covering

Regions ever covered. Motivate observers to be active during runs

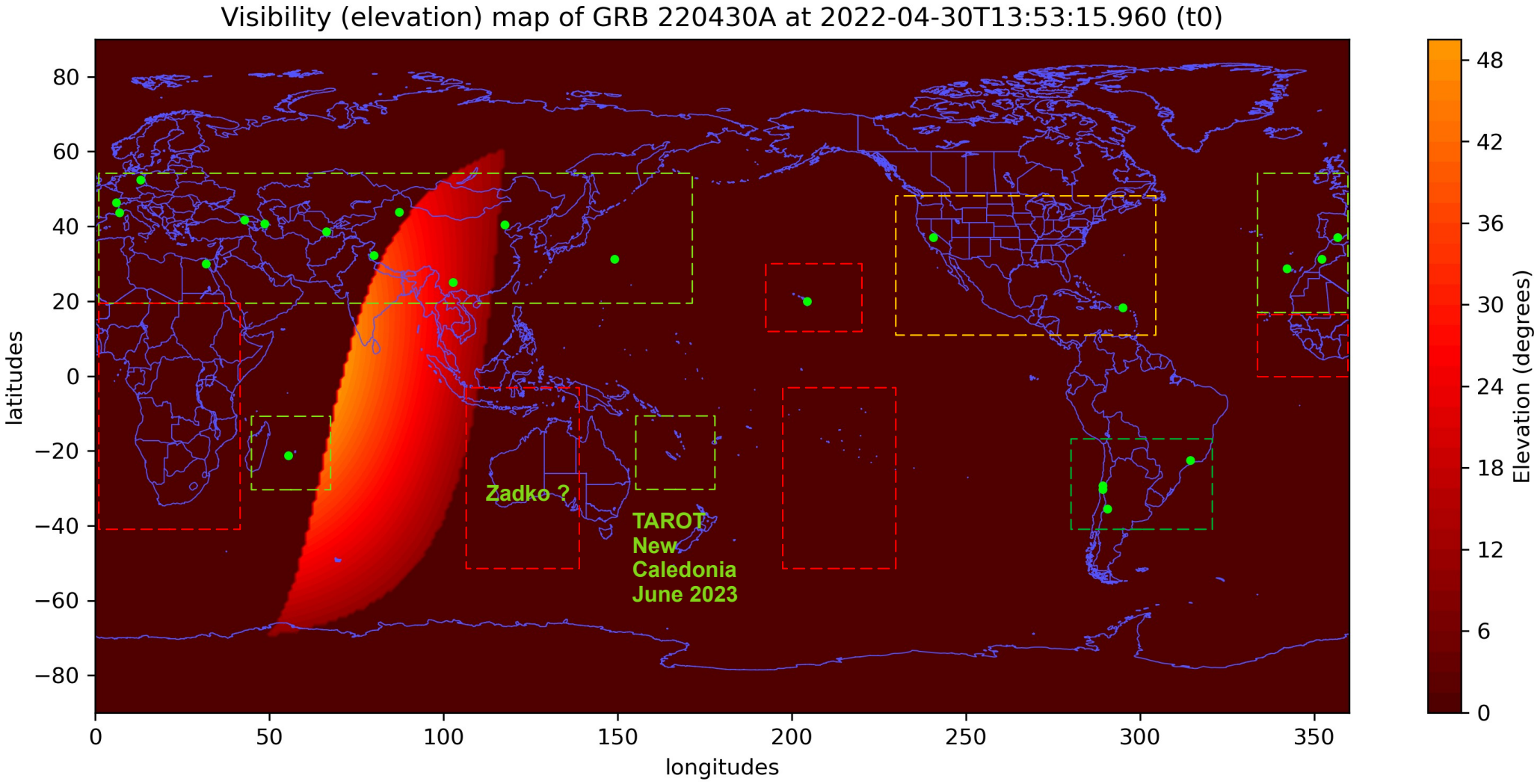
Regions remaining to be covered. Find new collaborators.



Extend the GRANDMA network
Where to put new telescopes for prompt covering

Regions ever covered. Motivate observers to be active during runs

Regions remaining to be covered. Find new collaborators.



Observational facilities for "early"
Future prospects

Telescope managing :

- Add new telescopes in the "red" regions (Australia, central and south Africa, Polynesia)
- Reinforce with new telescopes in the "orange" region (USA)
- Keep motivated telescopes in the "green" regions.

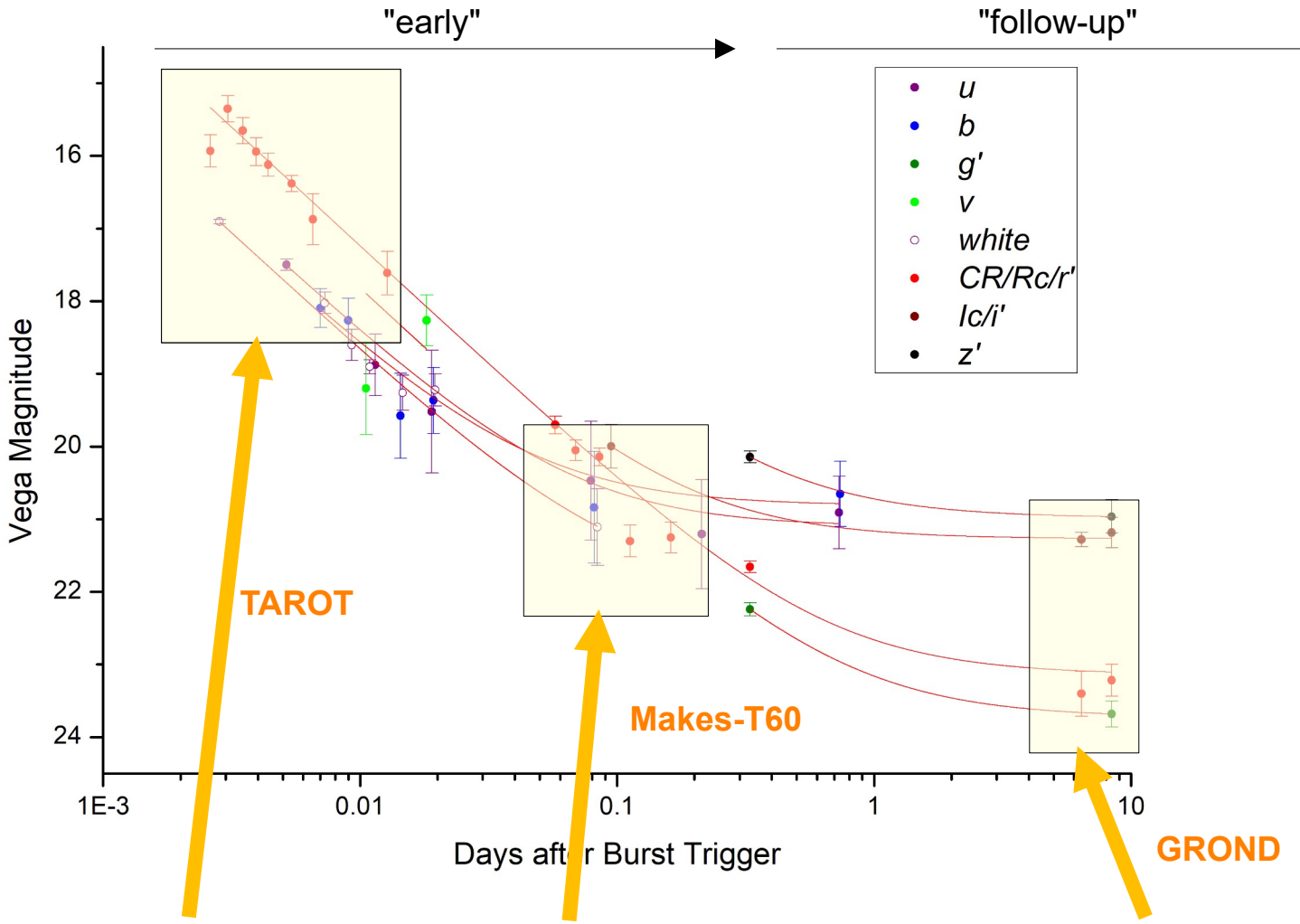
The profile of a telescope for "early" :

- Aperture diameter : 1m to 0.2m
- Field of view : 10° to 0.5°
- Filters : None to griJH
- Reaction time : < 1 min to < 5 min
- Operating mode: Robotic to Teleoperated

Observational facilities for "follow-up"

Feed back of the GRB 220427A

Data plotted kindly
by A. Kann



Field of view 1 to 10°
Filter clear
photometry at 0.5 mag

Field of view 10' to 30'
Filter clear
photometry at 0.5 mag

Field of view 1' to 15'
Filter clear or grJHK
Photometry at 0.2 mag
Spectro mag 19-22

Field of view 1' to 15'
Filter clear griJHK
photometry at 0.05 mag
Spectro mag 19-22

TAROT
FRAM
OAJ

0.5 to 1m telescopes

Meter telescopes : Many in GRANDMA
Spectro : CFHT, VLT, GTC
KiloNovaCatcher : > 0.3 m

Observational facilities for "follow-up"
Future prospects

Telescope managing :

- Photometry : Large aperture telescope (new collaborations, new dedicated telescopes)
- Spectrometry : ToO with GTC, VLT, etc.

The profile of a telescope for "follow-up":

- Aperture diameter : 8m to 1m
- Field of view : 0.3° to 0.1°
- Filters : griJHK to gr
- Reaction time : < 1 day to < 3 days
- Operating mode: Teleoperated or Manual