

The French Ground Follow-up Telescope

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Transient sky follow-up telescopes!

The GFTs will play an important role in the SVOM system:

- To observe the early optical afterglow during the slew of the satellite.
- To provide fast accurate positions of faint and dark GRBs.
- To provide a fast redshift estimator to trigger instantly the largest facilities (VLT and NTT in particular).
- To complement the follow-up of sources observed by SVOM during the General Program.

But they will be also fast follow-up facilities for astroparticle physics at large: neutrinos, gravitation waves, supernovae from LSST, VHE sources, etc.

French-GFT concept

Develop a new robotic telescope:

- Delay between alert reception and start of an observation: <30 sec.</p>
- Primary mirror diameter: about 1.3 m.

Two (maybe three) simultaneous arms:

- Wide field of view: 26 arcmin.
- Visible domain.
- Infrared domain: up-to H band.

A dedicated telescope:

to observe all the GRB alerts (even the low thresholds delivered by SVOM).



Main partners

Main laboratories involved:

France (by alphabetical order): CEA, CPPM, GEPI, IRAP, LAM and OHP/ OSU_Pytheas.

Mexico: UNAM.

Access to the telescope crudely proportional of the investment of each partner:

To be specified in a MoU.

SVOM's alerts will have the highest priority: be authorized to stop ongoing observations.

San Pedro Martir Observatory

A « standard » astronomical site:

- Median seeing: about 0.8 arcsec.
- About 80% of observable night (60% photometric).
- Located in a protected national park.







Main requirements on the telescope

Mount type	Alt-Azimutal
Diameter of the primary mirror	1.2 to 1.3 m
Field of View (diameter)	26'
Delay to point in a given position	30 seconds (in 90% of the cases)
Pointing accuracy	< 5 arcsec RMS
Tracking accuracy without autoguider	< 0.8 arcsec RMS (exposure time: 30 min)

Main requirements on the instruments

Number of simultaneous arms	 Minimum : 2 arms (1 in the visible et 1 in the NIR). Goal : 3 arms (2 in the visible et 1 in the NIR).
Sensitivity (60 sec, 5 sigma)	• R = 20.5 • J = 19.0
Spectral band	Each arm has its own filter wheel : • Visible : clear, Pan-STARRS g, r, i, z and maybe y. • IR : J et H.

Main requirements on the software

Delay between receiving the alert and begining an observation	30 seconds (in 90% of the cases)
Management of GCN and VOEvent notices	Permanent network connection
Data processing management	Automatic processing, with predefined strategy in the case of bursts
Deadlines to send information to the BA	First information delivered about 5 minutes after the alert reception

Scientific performances





Fraction of the SVOM alerts followed

Delay since trigger	F-GFT
60 sec	23 %
180 sec	26 %
3600 sec (1h)	33 %
61200 sec (17h)	65 %

This fraction takes into account the sky coverage efficiency, the weather conditions and the telescope sensitivity.

Data delivered to a BA

For each possible candidate (uncatalogued object, transient object, etc.):

- Image stamps around each candidate.
- Light curve in different bands.
- Redshift indicator.

Delay to receive information at FSC:

- First elements received 5 minutes after the alert reception by the F-GFT.
- Updated as and when the observations are continuing.

