
SVOM
Space-based multi-band astronomical Variable Objects Monitor
cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES
CHINESE ACADEMY OF SCIENCES
CNSA

SVOM MISSION

SVOM is a mission with a sharing of responsibility between CNSA and CNES defined in the MoU. The project is in C-phase. Satellite Qualification Model AIT phase will end at the end of this year. The launch is scheduled end of 2021.

The SVOM mission has been primarily designed for early detection and observation of all known types of gamma-ray bursts (GRB).

However, SVOM system has been upgraded taking into account the recent evolution of time domain and multi-messenger astronomy

With the Core Program SVOM shall :

- Detect transient phenomena in a wide field of view
- Localize and identify them as GRB candidates
- Alert burst advocates and ground observation systems in less than 30s after detection
- Measure the emission of detected GRBs in several spectral bands
- Quickly provide on ground arcsec positions of detected afterglows

COLIBRI involved in each GRB sequence

SVOM is also a space observatory and shall:

- Execute a long-term observation program planned from user's requests
- Manage Target of Opportunity (ToO) observations at short notice (12 hours)

COLIBRI involved if combined observations are requested

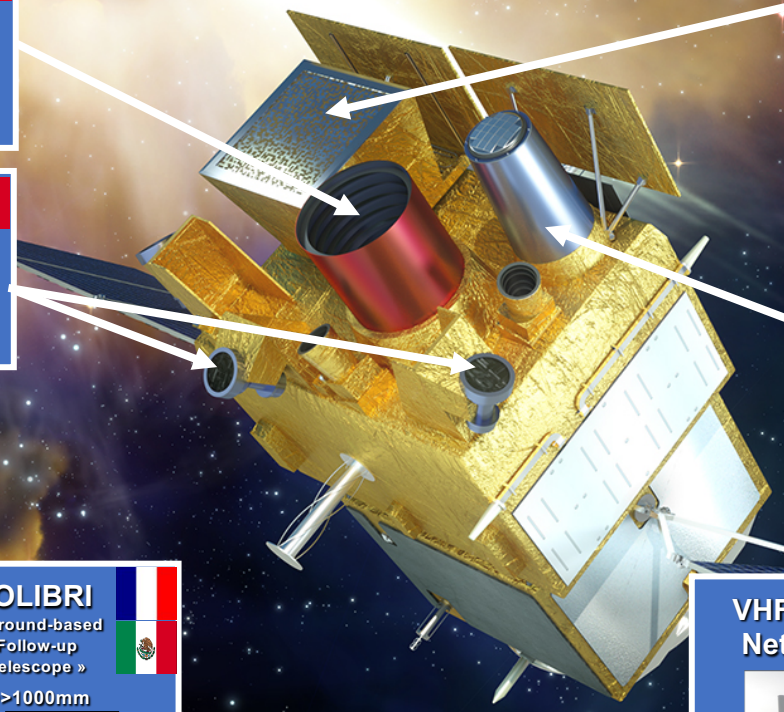
SVOM instruments (board and ground)

VT
"The Visible Telescope"
Narrow-field visible telescope
Ritchey Chretien Φ=400mm
Localization accuracy < 1 arcsec

GRM
"The Gamma-Ray burst Monitor"
X-rays and Gamma-rays detectors
30 keV – 5 MeV
Localization accuracy < 2°

ECLAIRs
« The trigger camera »
Wide-field X and Gamma rays telescope
Spectral range : 4 keV – 150 keV
Localization accuracy < 13 arcmin

MXT
"The Micro-Pore Optics X-ray Telescope"
Narrow-field X-ray telescope
Spectral range : 0.3 keV – 10 keV
Localization accuracy < 2 arcmin



CGFT
« Ground-based Follow-up Telescope »
Φ>1000mm

GWAC
« Ground Wide-Angle Cameras »
Φ=180mm

COLIBRI
« Ground-based Follow-up Telescope »
Φ>1000mm

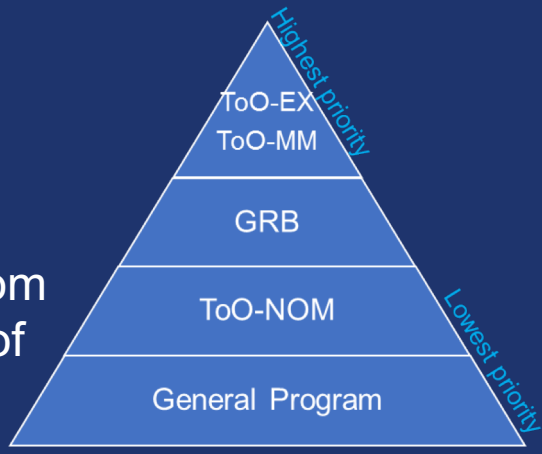
VHF Alert Network

… and more !

Tracking Antennas S and X

SVOM OBSERVATION PROGRAMS

- ✓ **Core Program (CP) : Gamma-Ray Burst observation (autonomous management on board and fast alert transmission on ground by VHF (30s)**
- ✓ **General Program (GP) : observation of astrophysical targets of interest compatible with the satellite attitude law optimized for GRB detection and observation (work plan uploaded each week)**
- ✓ **Target of Opportunity Program (ToO)**
  - ✓ ToO-NOM is the nominal ToO which covers the basic needs for transient follow-up (in less than 24h / uploaded each day).
  - ✓ ToO-EX is the exceptional ToO in case of an exceptional astrophysical event we want to observe rapidly (in less12h)
  - ✓ ToO-MM is dedicated to EM counterpart search in response to a multi-messenger alert. What differs from the ToO-NOM and ToO-EX is the unknown position of the source within a large error box (tiling mode)



Operational Scenario for GRB detection

SVOM Satellite

ECLAIRs detects a new gamma-ray burst

Automatic slew and observation start

S Band

VHF Band

X Band

SVOM users

Robotic Telescopes
- COLIBRI
- C-GFT
- LCOGT …

Large Ground Telescopes

GRB Alert Trigger + 30s

TC/TM

VHF alert data

Science and HK data

Chinese Control Center

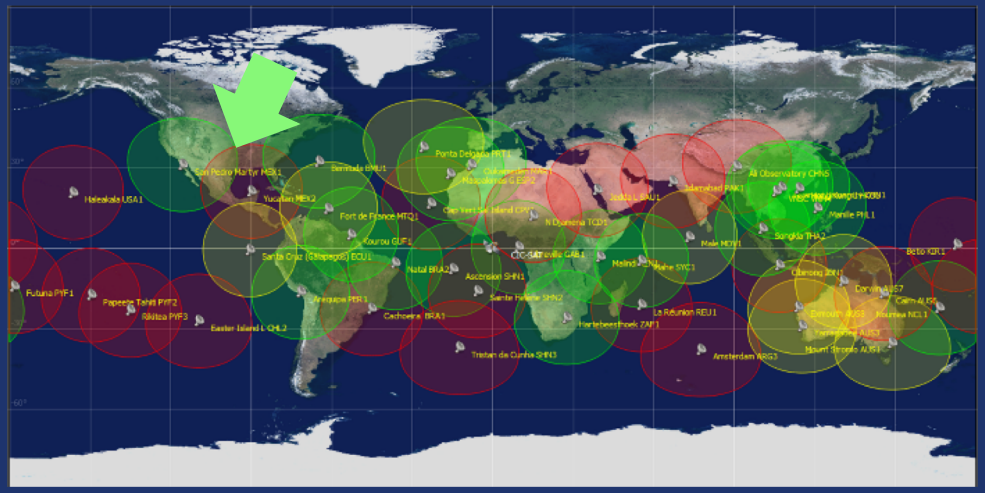
Alert data processing by French Science Center

Science data processing by French and Chinese Science Centers

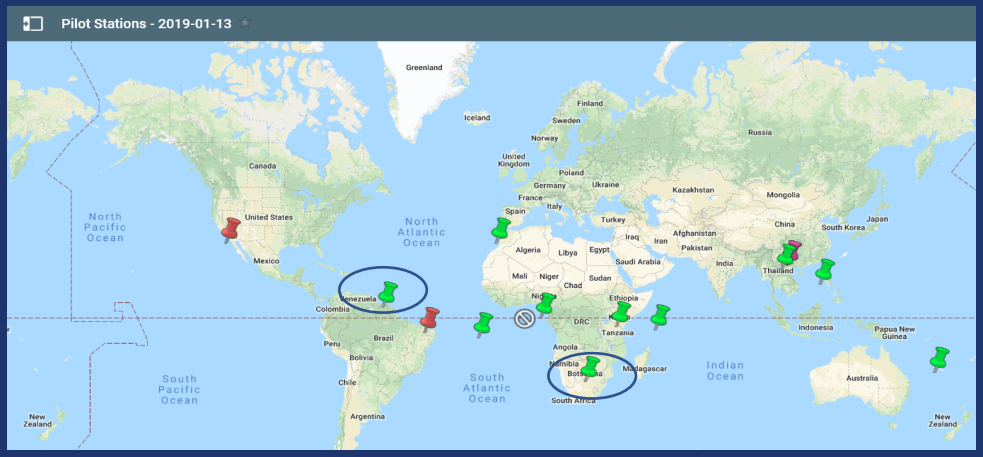
SVOM Mission Operations

VHF Network

The VHF Ground Station



The full VHF Network for the SVOM mission



VHF Network : the first Ground Stations to be deployed in 2019/early 2020

Agreement to install 2 VHF in Mexico (San Pedro Martir and Yucatan)

Thank you for your attention

¡ Muchas Gracias!

Merci

谢谢

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