About the Svom mission

September2017

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French science centers Project manager CEA
Irfu

- A scientific collaboration between China and France
- A difficult and complex history
- The center of mass moved eastward in 2015

- Launch foreseen by end of 2021 by a Long March rocket

- Altitude of the orbit : 630 km, inclination of 30°
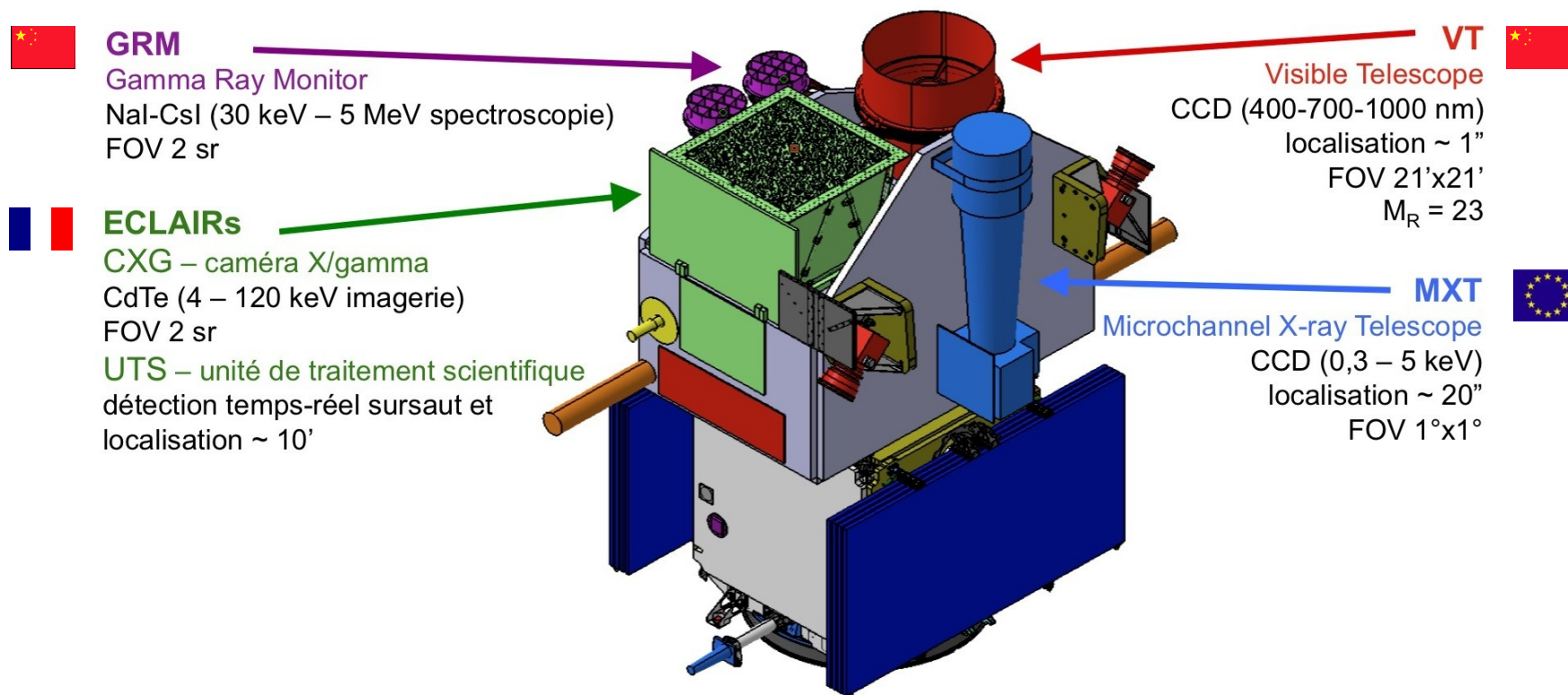- Duration of the mission 3 (+3) years

- In France Cnes – the space agency – manages the project
- In China Academy of Sciences is in charge

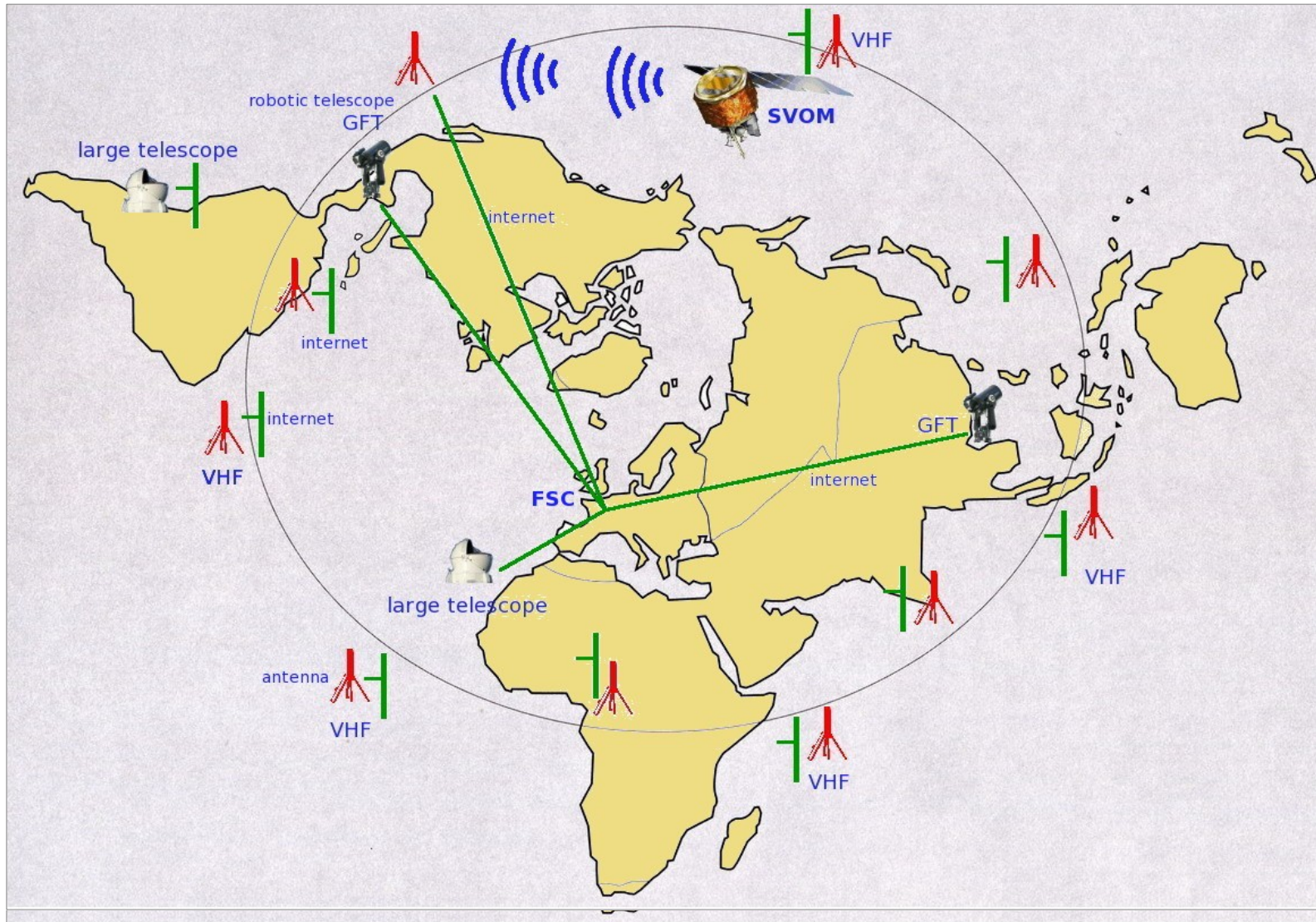- Dr Bertrand Cordier from Irfu is the French PI

- Equipments are developed by different laboratories in France, UK and Germany

- Permit the detection of all know types of GRBs, with a special care on high-z GRBs and low-z sub-luminous GRBs

- Provide fast, reliable and accurate GRB positions

- Measure the broadband spectral shape of the prompt emission (from visible to MeV)

- Measure the temporal properties of the prompt emission

- Quickly identify the afterglows of detected GRBs, including those which are highly redshifted (z>6)

- Quickly provide (sub-) arcsec positions of detected afterglows

- Quickly provide redshift indicators of detected GRBs

2 Chinese instruments and 2 European ones

GRM
Gamma Ray Monitor
NaI-CsI (30 keV – 5 MeV spectroscopie)
FOV 2 sr

ECLAIRs
CXG – caméra X/gamma
CdTe (4 – 120 keV imagerie)
FOV 2 sr
UTS – unité de traitement scientifique
détection temps-réel sursaut et
localisation ~ 10'

VT
Visible Telescope
CCD (400-700-1000 nm)
localisation ~ 1"
FOV 21'x21'
$M_R = 23$

MXT
Microchannel X-ray Telescope
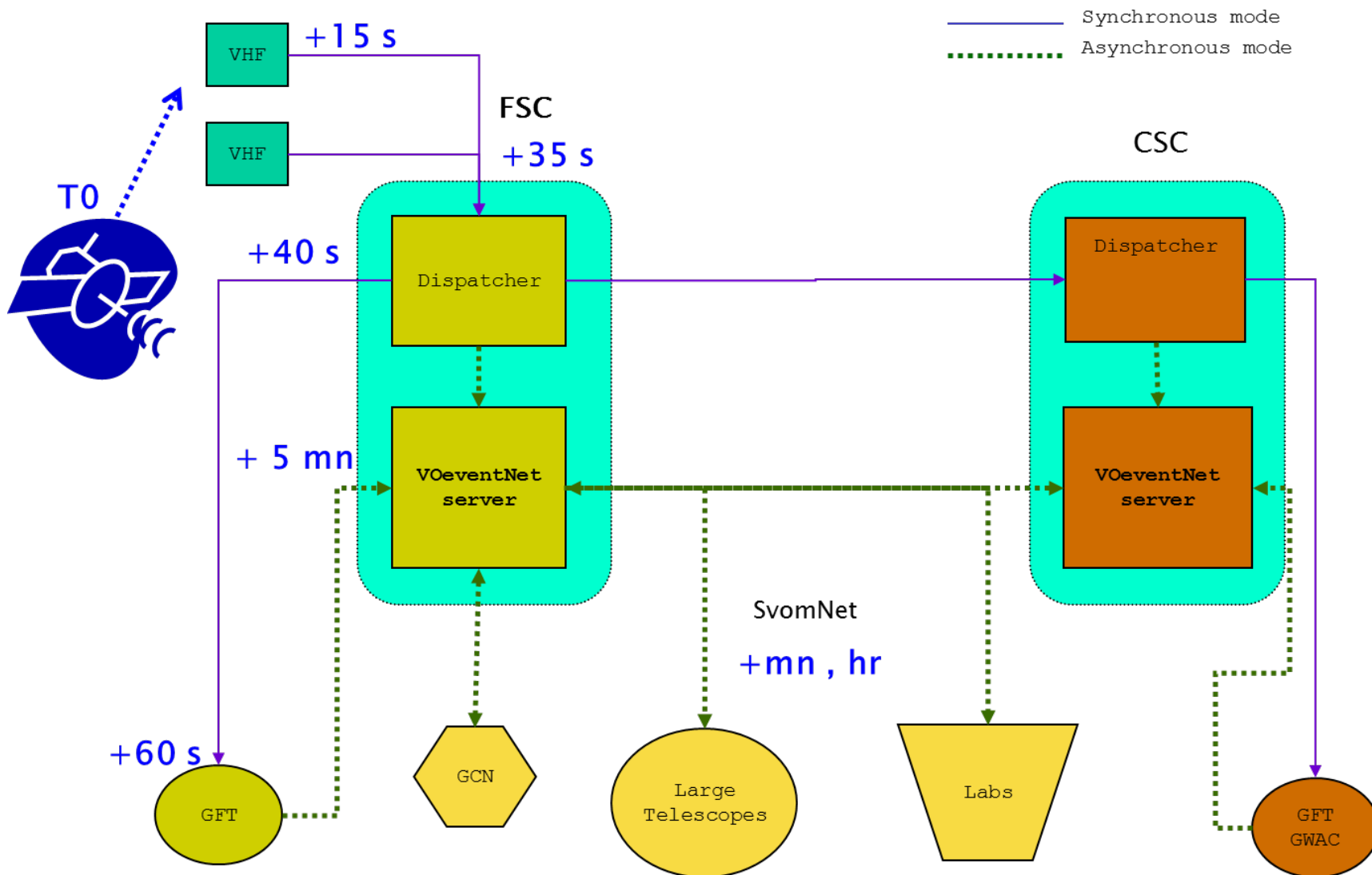CCD (0,3 – 5 keV)
localisation ~ 20"
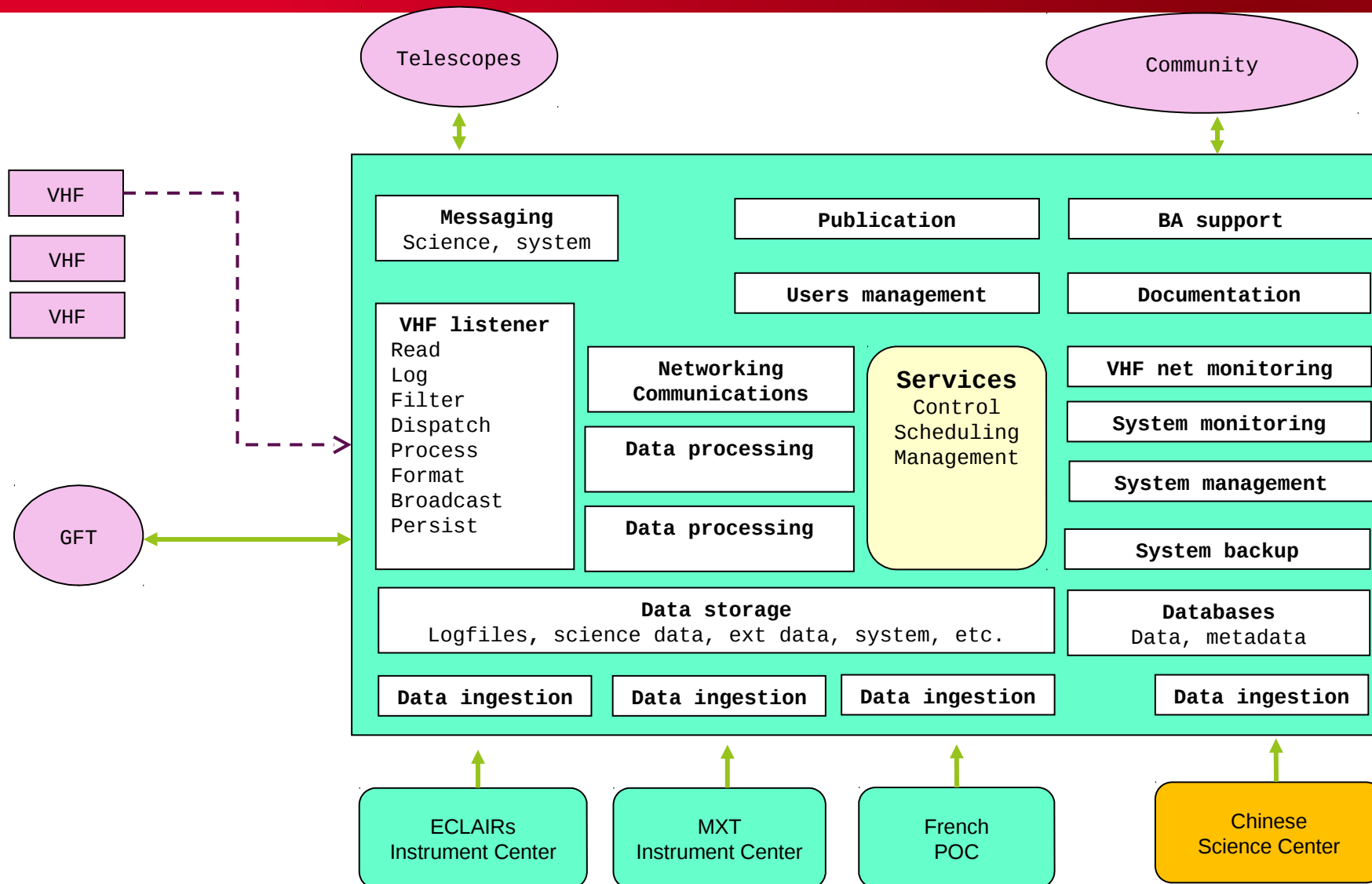FOV 1°x1°

The French Science Center listens to the spacecraft

Svom is based on the same principle as Hete2

The spacecraft stays permanently in contact with the ground thanks to a VHF radio link

SVOM – 39 Stations – site : 5 deg

Orange = DORIS / Jaune = Sicile / Bleu = MIT / Vert = Theorique
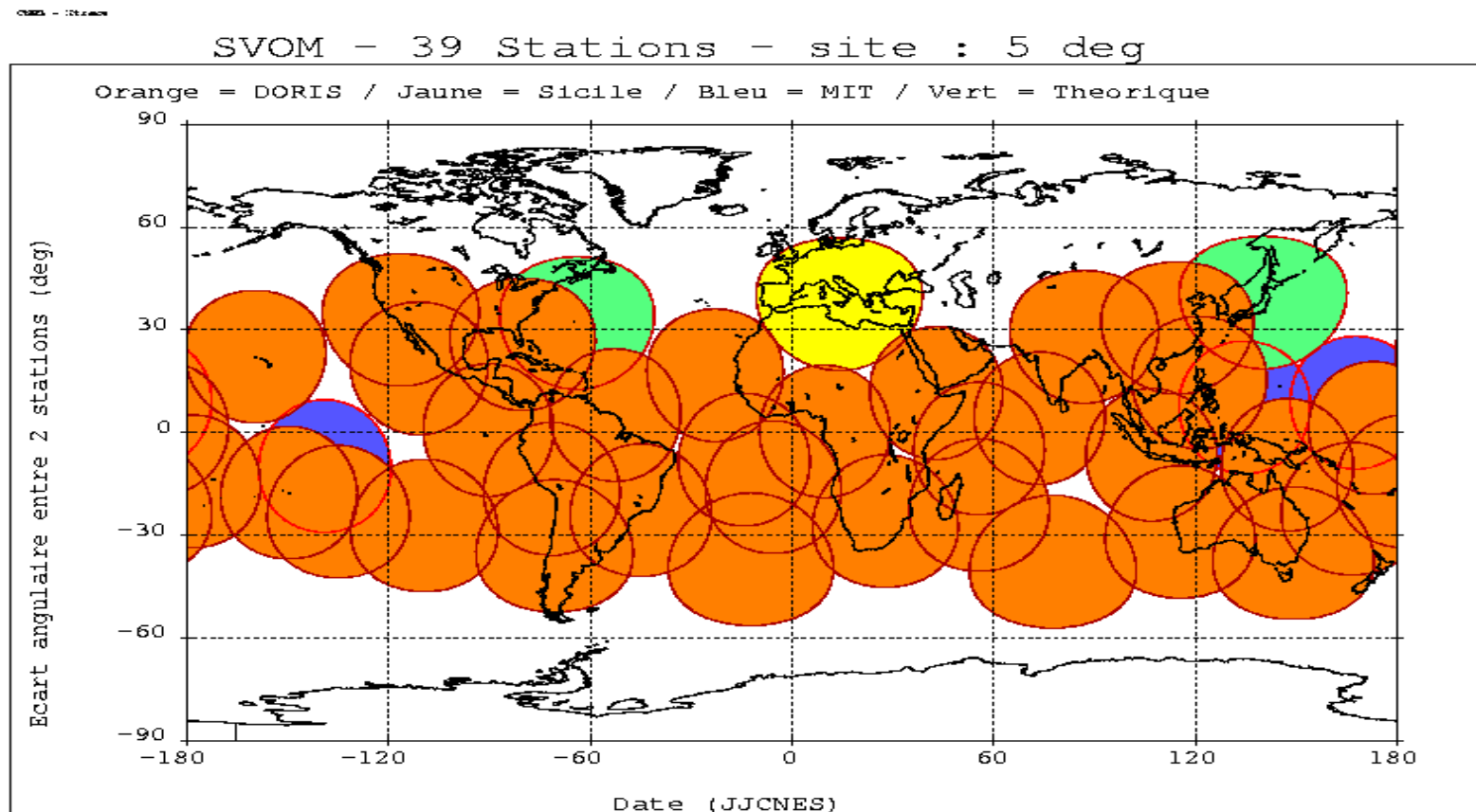
- The core program,
  - Devoted to the GRB detection and the follow-up

- The general program
  - Svom does not stay idle
  - Observations are programmed

- The ToO program

FRENCH SCIENCE CENTER ARCHITECTURE

Telescopes

Community

VHF

VHF

VHF

GFT

Messaging
Science, system

Publication

BA support

Users management

Documentation

VHF listener
Read
Log
Filter
Dispatch
Process
Format
Broadcast
Persist

**Networking
Communications**

Data processing

Data processing

Services
Control
Scheduling
Management

VHF net monitoring

System monitoring

System management

System backup

Data storage
Logfiles, science data, ext data, system, etc.

Databases
Data, metadata

Data ingestion

Data ingestion

Data ingestion

Data ingestion

ECLAIRs
Instrument Center

MXT
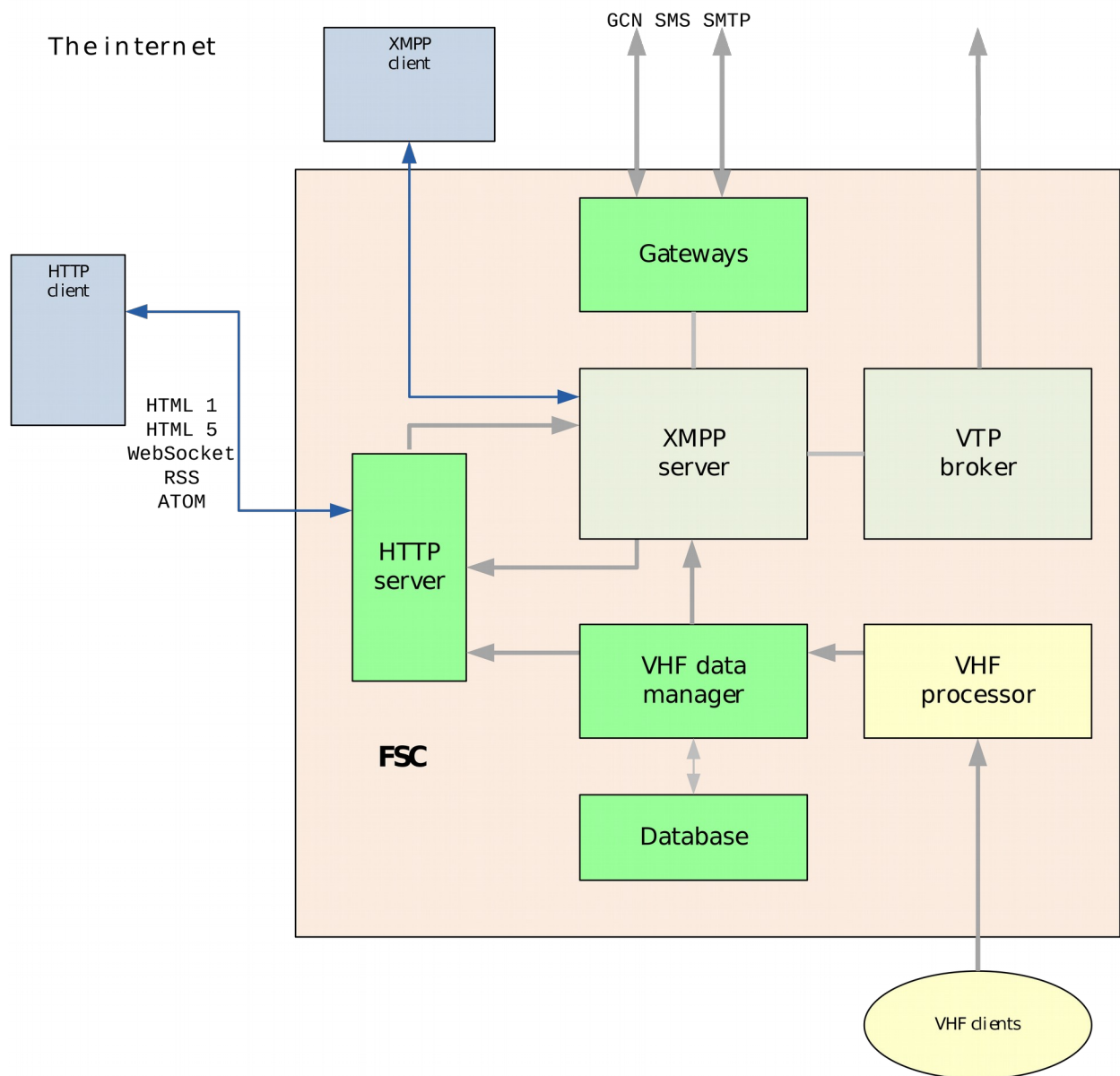Instrument Center

French
POC

Chinese
Science Center

- RESTful interfaces based on https
- Java with Jersey, Python with Flask, Go
- Spring framework
- API generated with Swagger

- Gitlab, Gradle, Sonarqube, Jenkins

- Docker
- Postgresql
- Nats

- Cloud (OpenStack) @ In2p3 Computing Center
- OpenVPN

A comparison of VTP & XMPP

VTP	XMPP
Simple	Complex
Simplistic	Powerful
Developed from scratch	Mature technology born in 1998
Tiny community	Large community
No consensus	IETF standard
Used and working for VOEvent	No longer used for VOEvent
Specific clients needed	Bunch of standard clients available

Openfire server installed, configured and tested
http://www.igniterealtime.org/

Manage the XMPP protocol

It supports the pubsub messaging system
Test programs have been implemented.

It has been successfully Dockerized recently at
Saclay

VTP : VOEvent Transport Protocol

Comet: a python implementation of VTP
http://comet.transientskp.org/
LOFAR transient key project

A java version has been implemented (code available in git)
fr.svom.xmpp.clients.VtpClient

The comet broker has also been Dockerized at Saclay.

I don't want to change the tools I'm used to working with !

Everybody has been using GCN for decades, it is the *de facto* standard !
Actually, the current VoEvent streams are just GCN messages which have been xmlified !

I've heard that there is a IVOA recommendation about VoEvent, but I don't know where to find it !
I've no time to waste trying to figure out how to deal with XML schema !

I'm a high level scientist, XML is boring, it is only for my programmers !

A row in a table looks like :
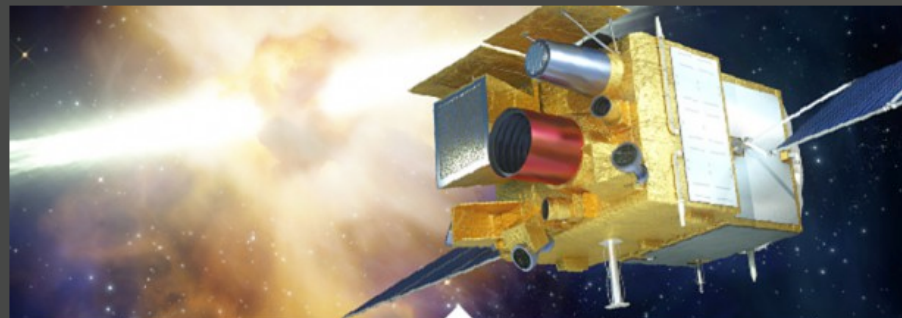`<TR><TD>34.01</TD><TD>0.80</TD><TD>63.3</TD><TD>1997ApJS..109..333W</TD></TR>`,
are you kidding ?

Json format is much better than XML !

I could not find any user-friendly tool to process my VoEvents !

I doubt that VoEvent format will be able to handle streams of thousands of events by hours !

http://www.svom.fr