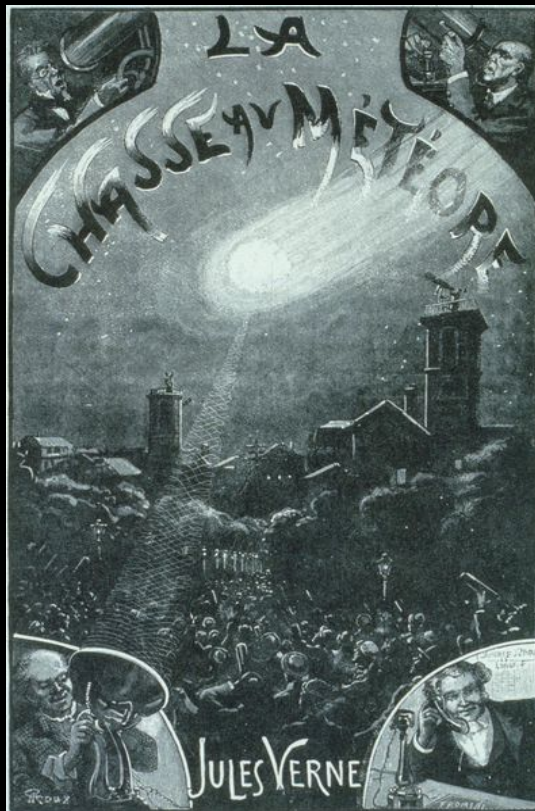


# Fripon ( Fireball Recovery and Inter-Planetary Observation Network )

## Vigie Ciel ( Citizen science program )



Uccle, 2016 Nov 29th

FRIPON



l'Observatoire de Paris



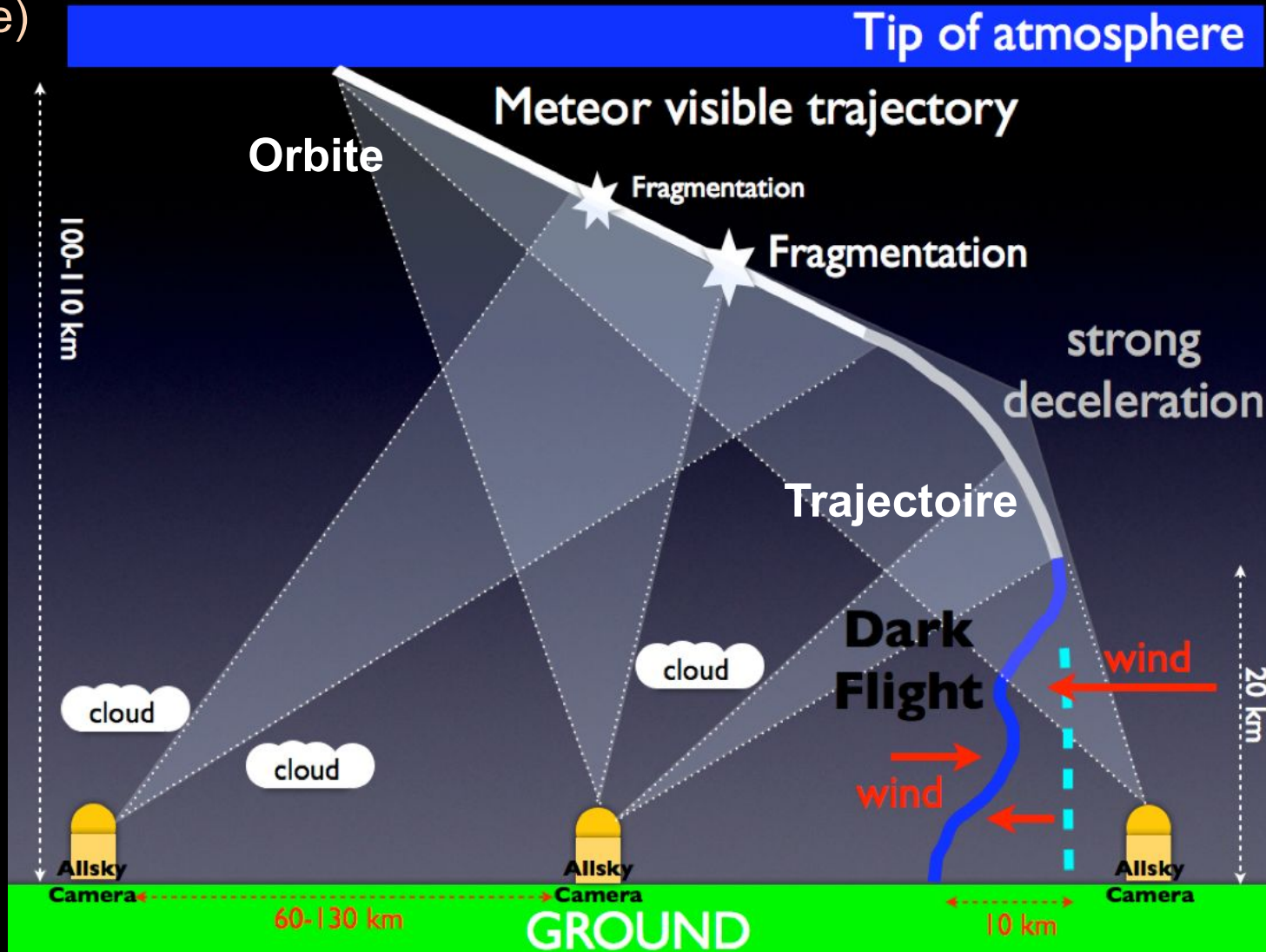
IRAP

Institut Pythéas



# Orbite et trajectoire

Utilisation des 100 caméras et de 25 stations radio (vitesse du météore)



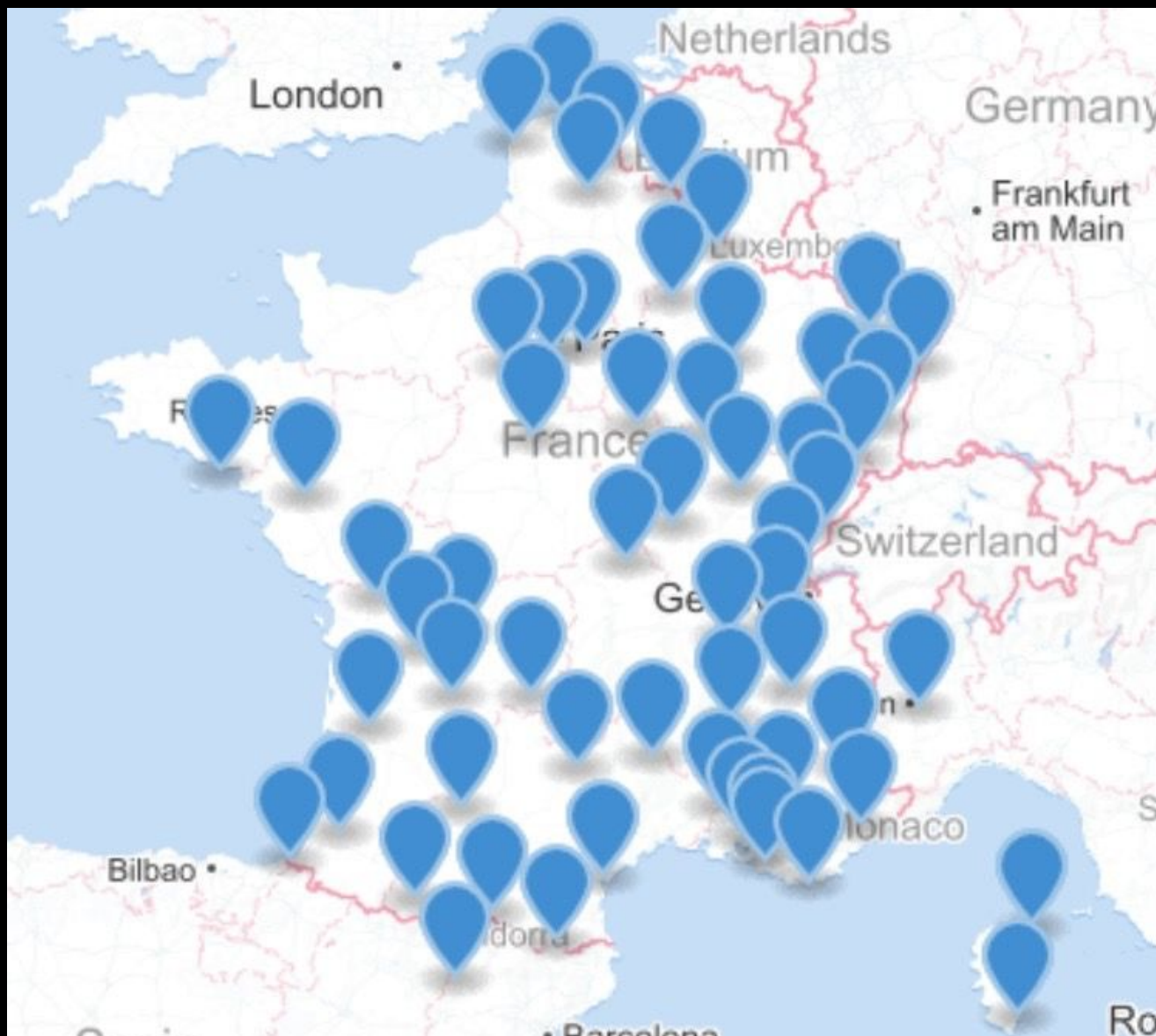
# Design de la caméra FRIPON (Shelyak)

- Digital cameras (chip Sony ICX 445)
- 1.2 mega pixels
- Fish eye lens : 1.25mm F/2.0
- $10^{-6}$  sec temps d'exposition de jour
- 30 fps
- GigE Vision protocol
- PoE alimentation : cable 100 m
- Refroidissement passif (PoE => 8w)

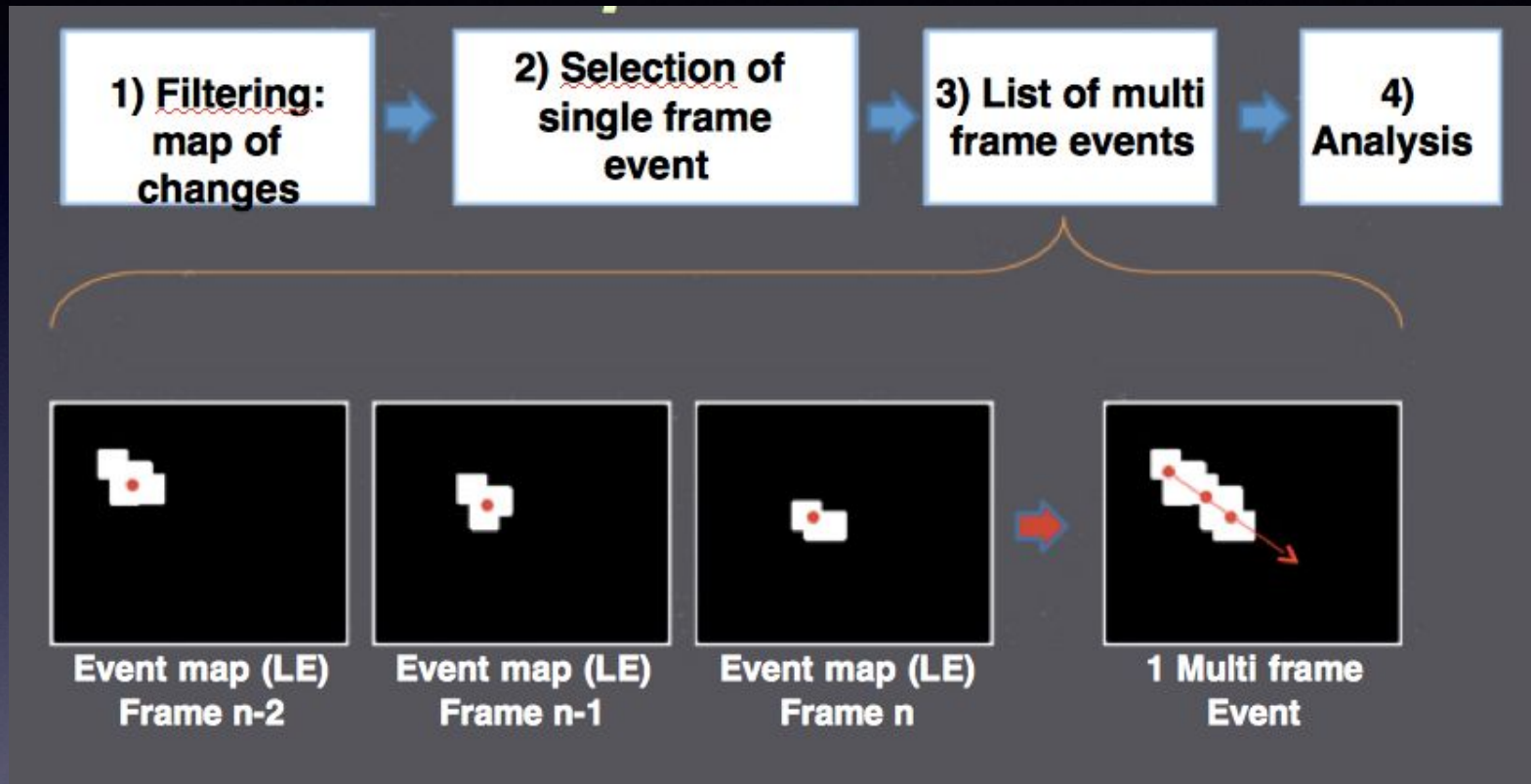




2/3 des caméras sont maintenant actives  
[www.fripon.org](http://www.fripon.org)

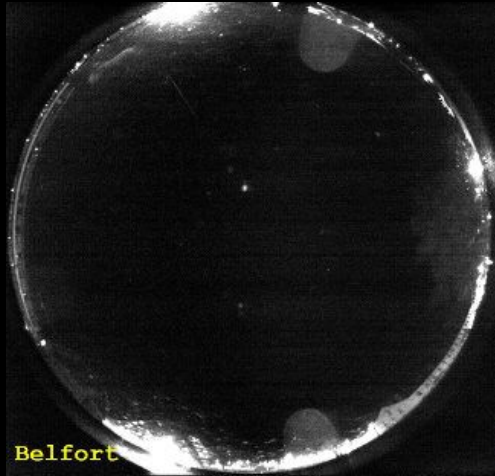


# Acquisition - Detection

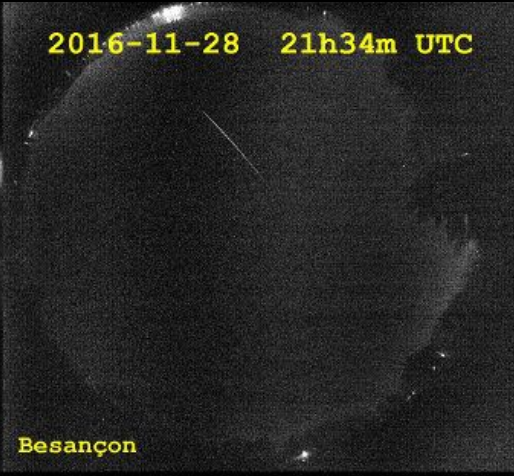


🕒 Tag sent to “big” server for each detection

2016-11-28 21h34m UTC



Belfort



Besançon



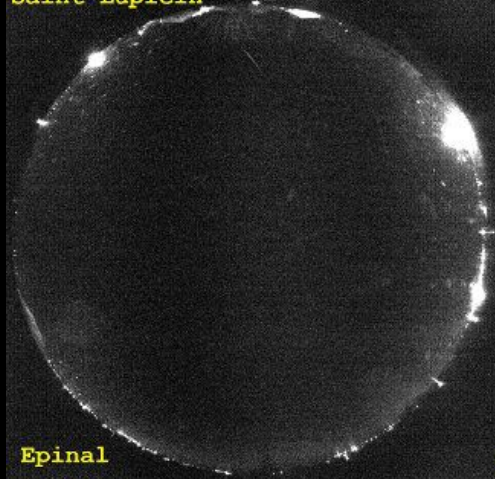
Pontarlier



Saint Lupicin



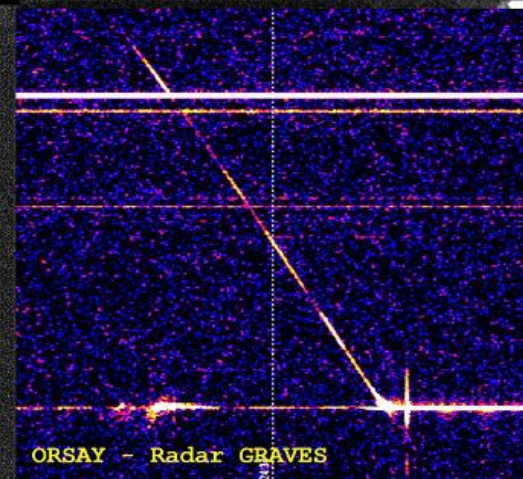
Osenbach



Epinal

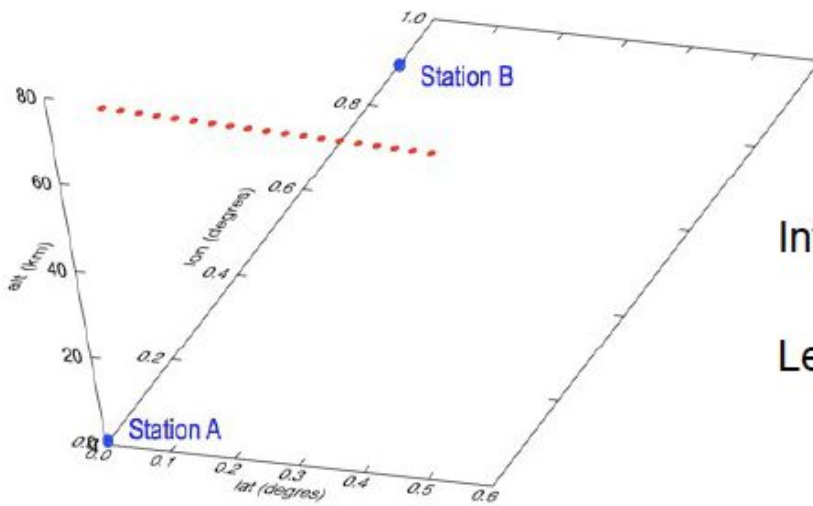


Glux en Glenne

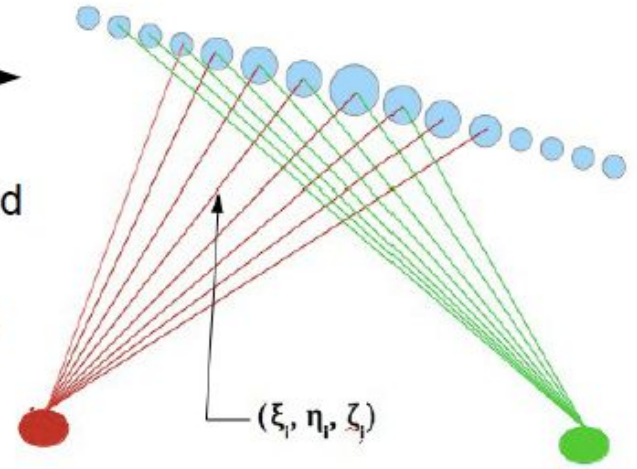


ORSAY - Radar GRAVES

# Trajectory and speed



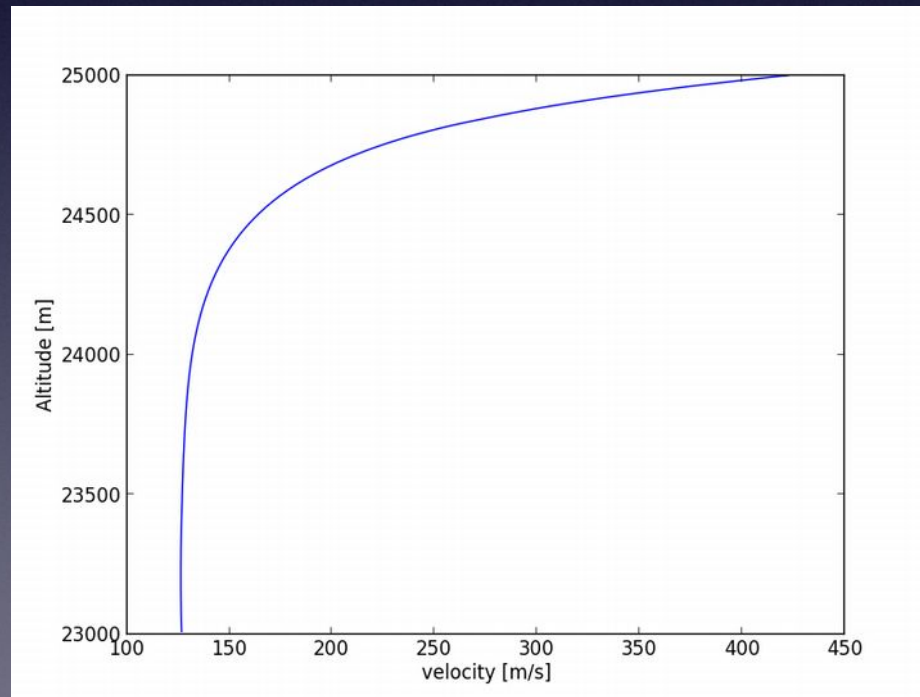
3D coordinates :  
Intersect planes method  
(Cepelcha, 1987)  
Least squares method  
(Borovicka, 1990)

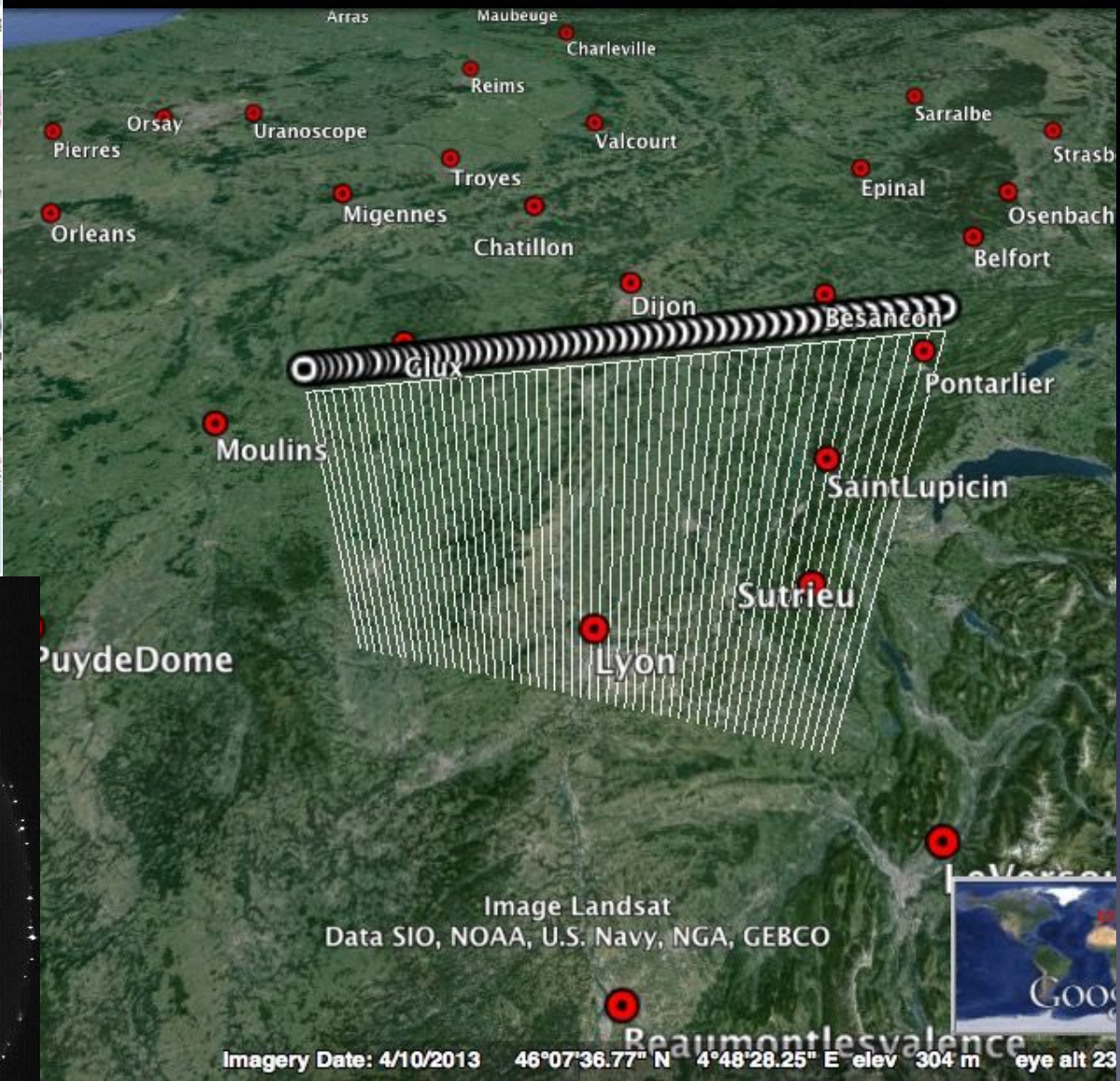




# “Dark Flight”

🕒 Date MeteoFrance & IGN

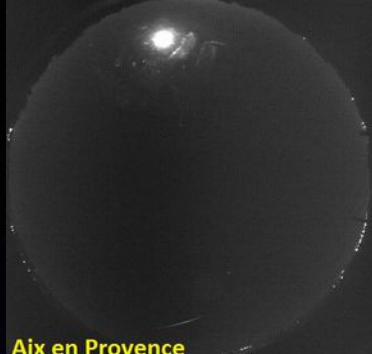




Lyon

2016 - 06 - 22

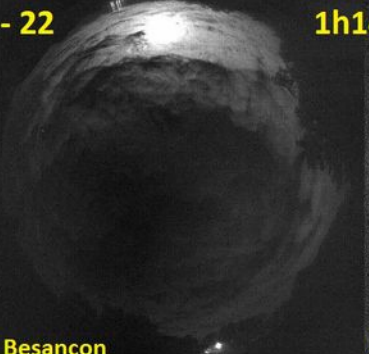
1h14m UTC



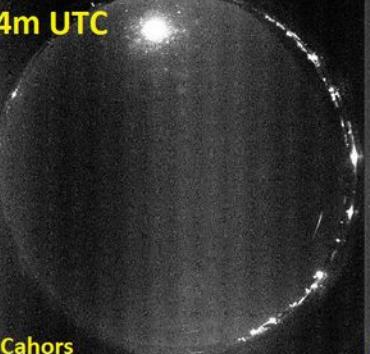
Aix en Provence



Beaumont les Valence



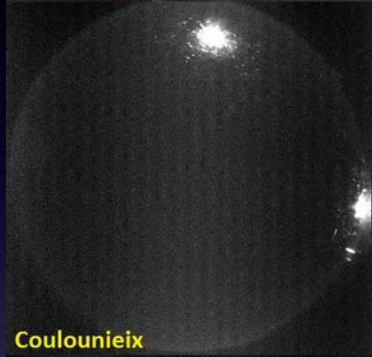
Besançon



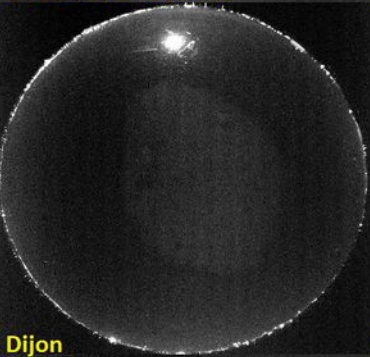
Cahors



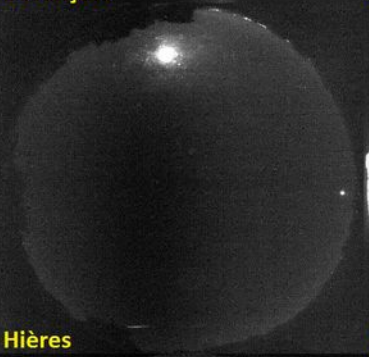
Caussols



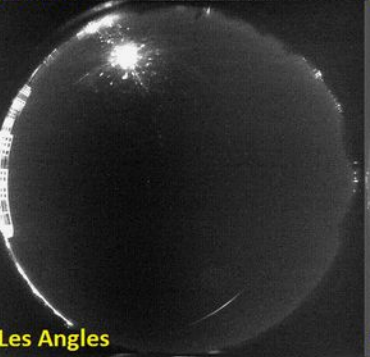
Coulounieix



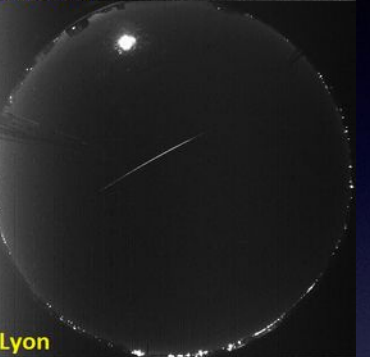
Dijon



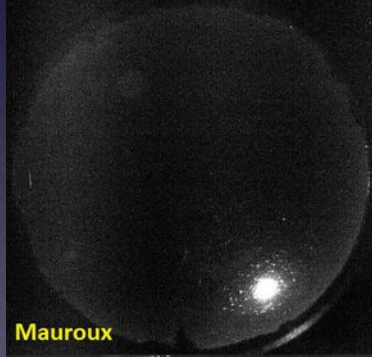
Hières



Les Angles



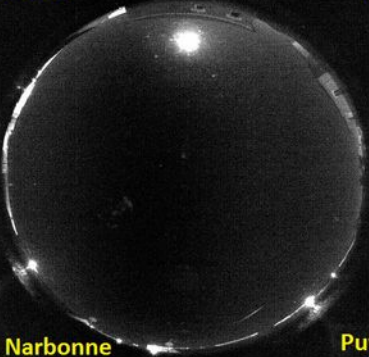
Lyon



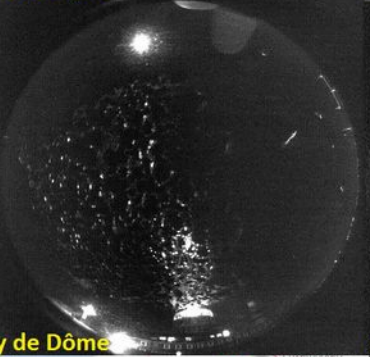
Mauroux



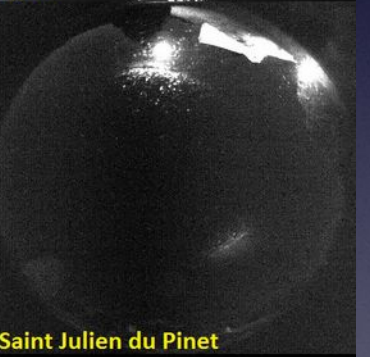
Moulins sur Allier



Narbonne



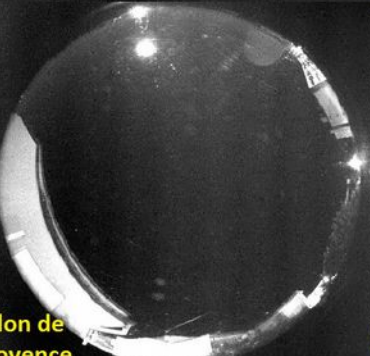
Puy de Dôme



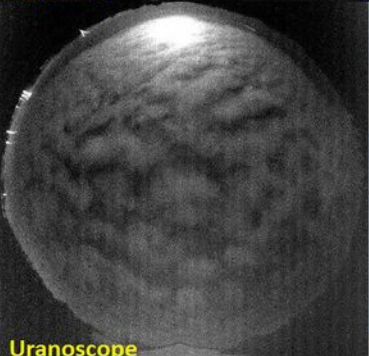
Saint Julien du Pinet



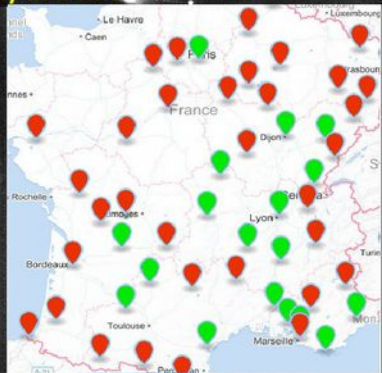
Saint Lupicin



Salon de Provence



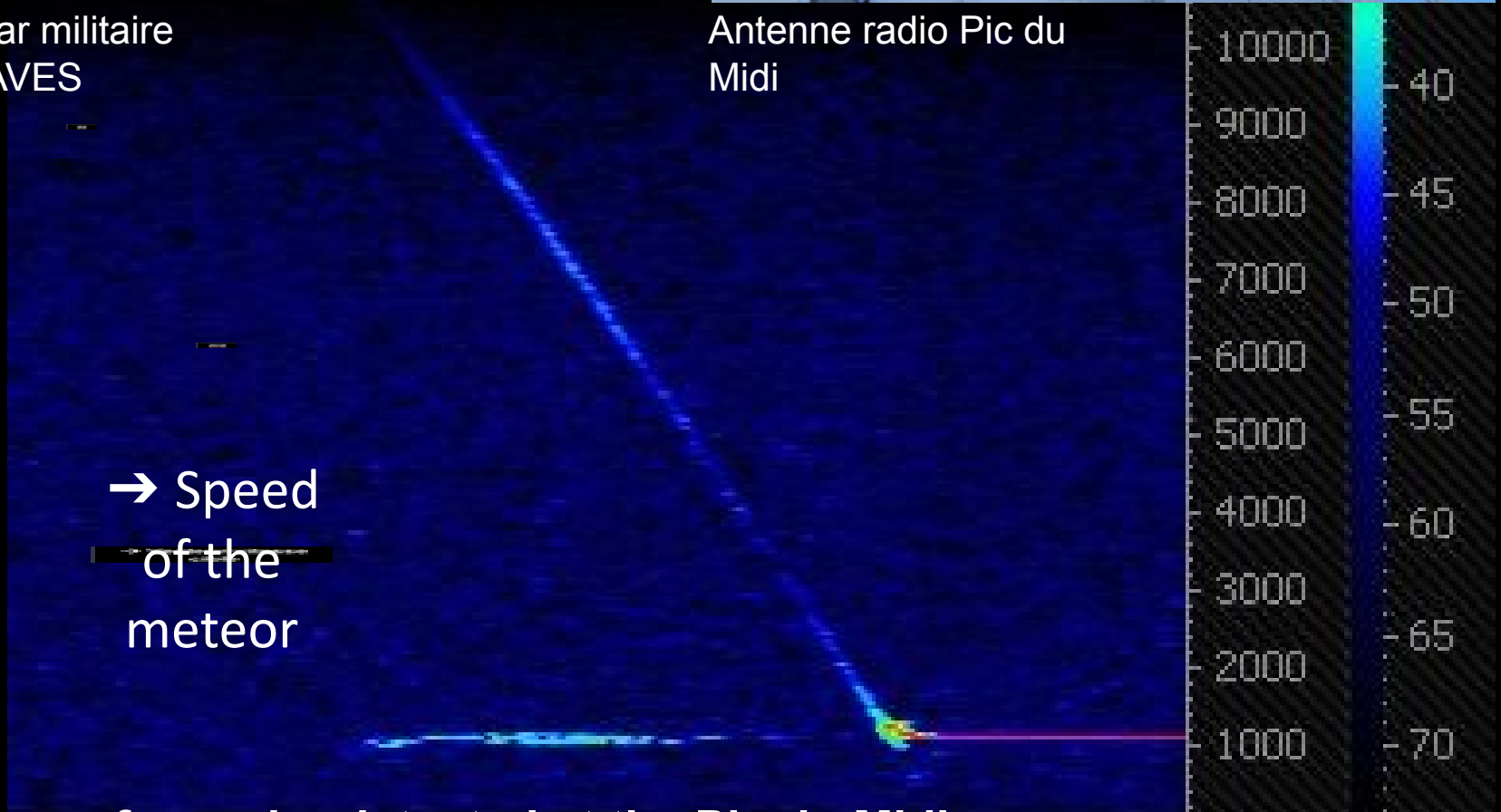
Uranoscope



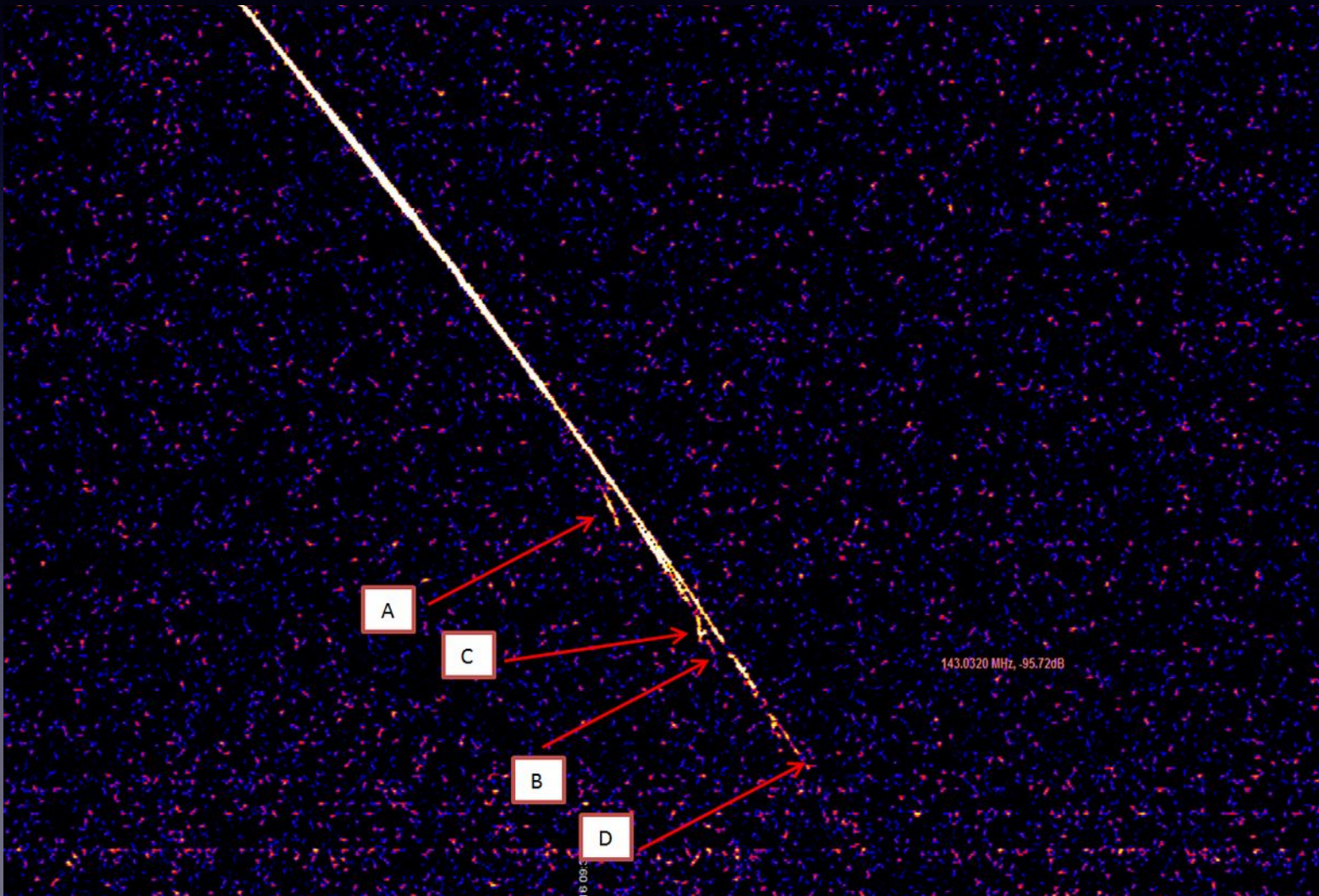


Radar militaire  
GRAVES

Antenne radio Pic du  
Midi



Exemple of an echo detected at the Pic du Midi



A

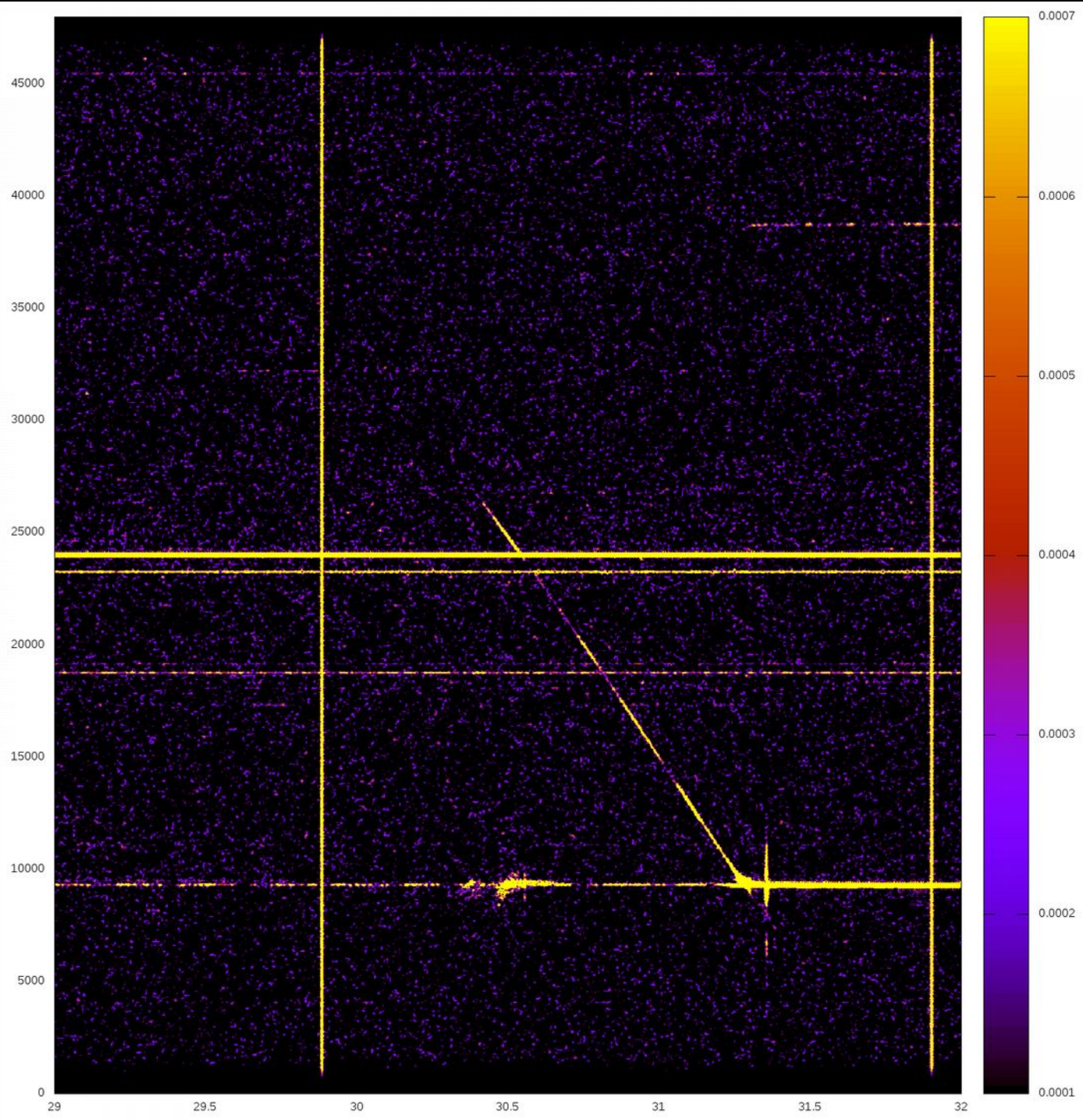
C

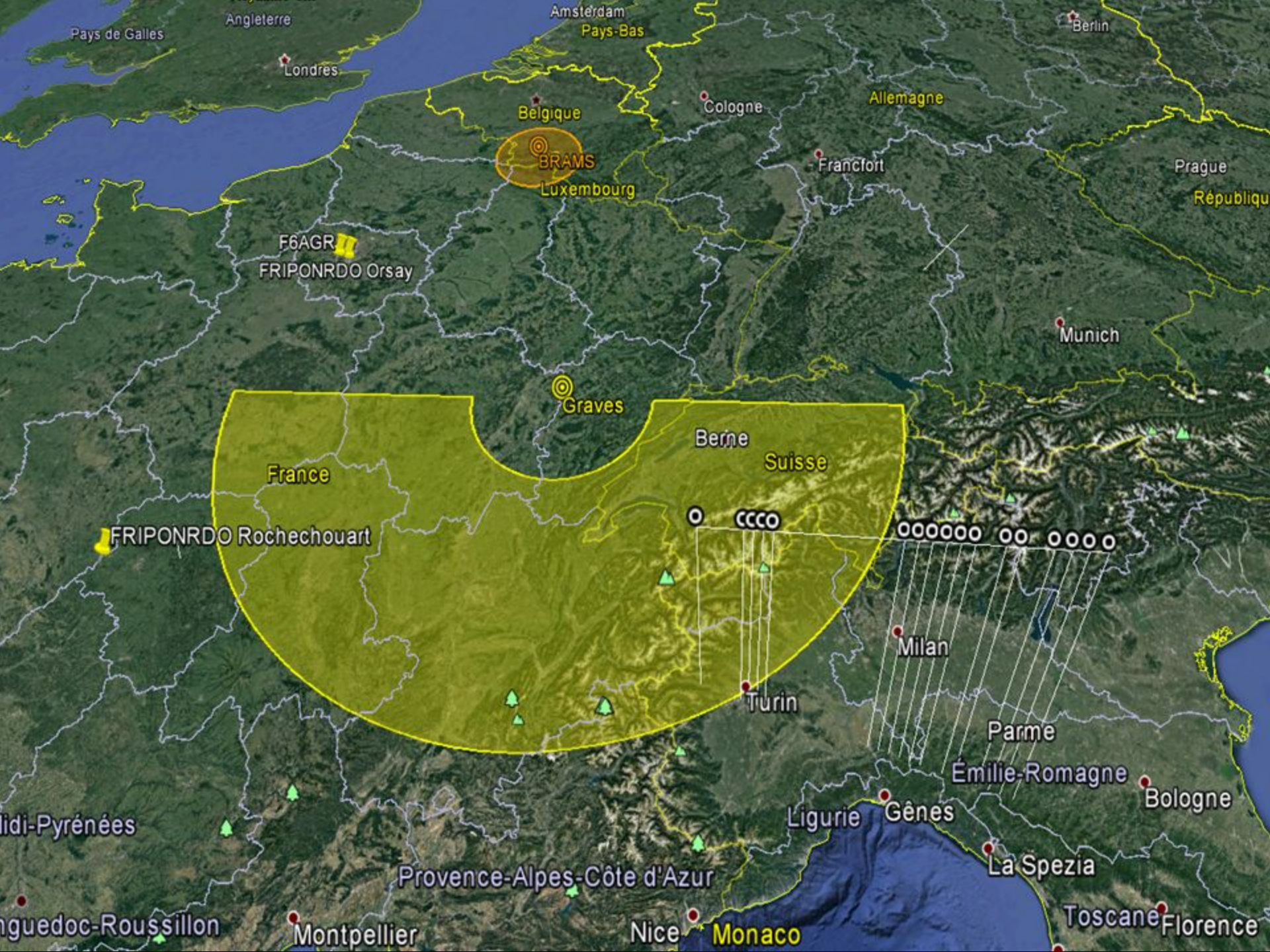
B

D

143.0320 MHz, -95.72dB

16.095





# FRIPON is a connected network





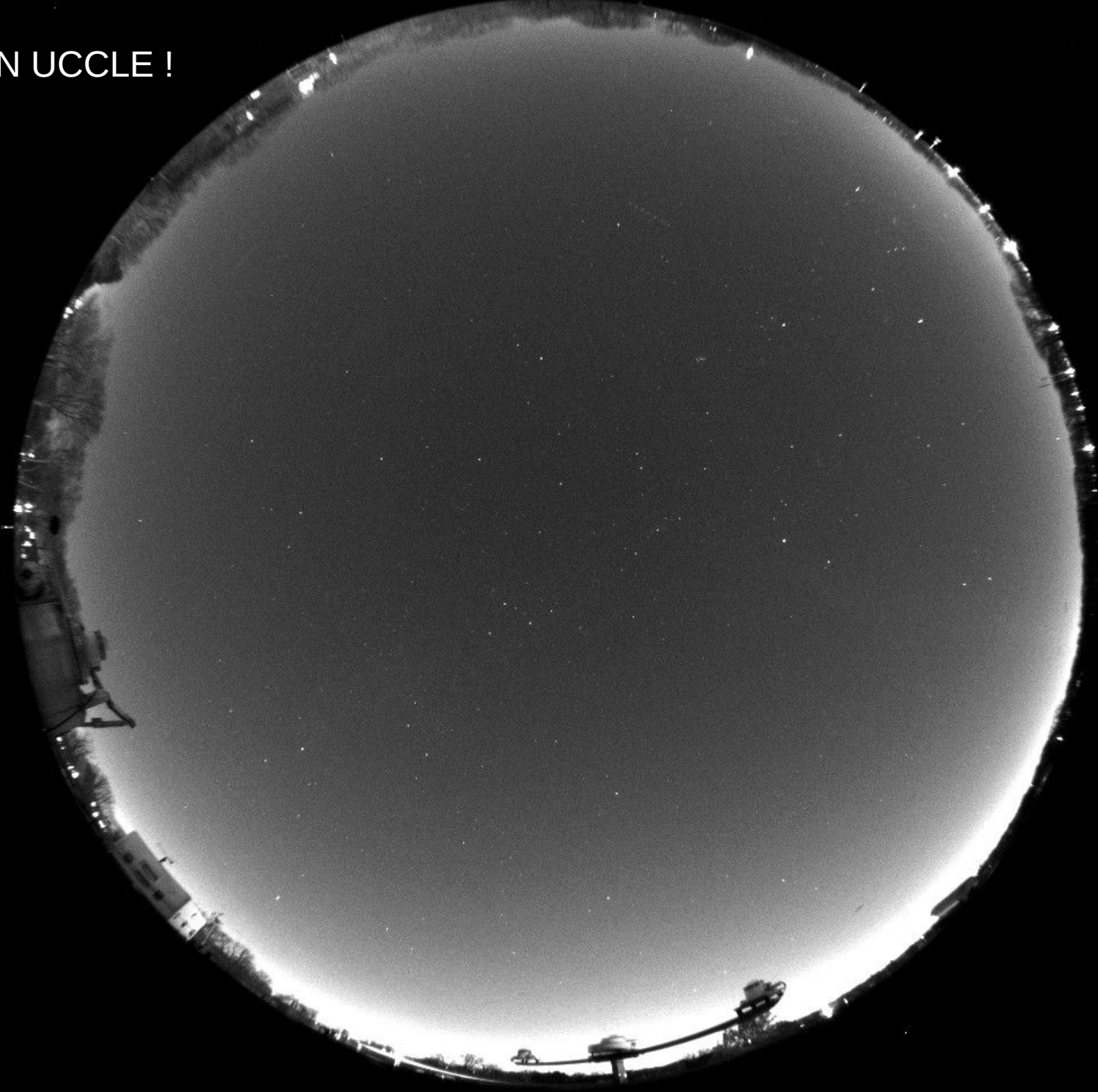
# FRIPON network extension



FRIPON UCCLE !



FRIPON UCCLE !



# Receivers GRAVES

