FRIPON, THE FRENCH FIREBALL NETWORK



F. Colas and the Fripon Team



Meteoroids 2016, Noordwijk, June 2016



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A comparison of meteorite falls observed in France in the 19th and the 20th century

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Test of several cameras



Test of several lens



fwhm 1.2 pixel in the frame center, 2 pixel at the horizon Pixel size : 10 arcmin

- Digital cameras (chip Sony ICX 445)
- 1.2 mega pixels
- Fish eye lens : 1.25mm F/2.0
- 10⁻⁶ sec exposure time for day time
- 30 fps
- GigE Vision protocol
- PoE allowing 100 m single cable
- Passive cooling (PoE => 8w)



ww.fripon.org



2/3 of the cameras are now active *www.fripon.org*





Acquistion and detection : FreeTure



https://github.com/fripon/freeture





Radar militaire GRAVES



Antenne radio Pic du Midi

	9000	- 40
df/dt	8000	- 45
	7000	- 50
dVr/dt	6000	
uvi/ac	5000	- 55
	4000	- 60
Speed of the motoor	3000	
- Speed of the meteor	2000	- 65
	1000	-70

Exemple of an echo detected at the Pic du Midi









FRIPON, last night

Sujet: [fripon-core.sciences] Multiple detection notification	ndex of /dat	a/multinle/20	16	0609T023938 UT/TALENC
 [fripon-core.sciences] Multiple detection notification 20160608T	F221233 UT	Fripon User	0	Jeudi 9 Juin 2016 01:00 CEST
[fripon-core.sciences] Multiple detection notification 20160608T	F233613 UT	Fripon User	٠	Jeudi 9 Juin 2016 02:00 CEST
[fripon-core.sciences] Multiple detection notification 20160608T	F233951 UT	Fripon User	٠	Jeudi 9 Juin 2016 02:00 CEST
[fripon-core.sciences] Multiple detection notification 20160608T	F234412 UT	Fripon User	0	Jeudi 9 Juin 2016 02:00 CEST
[fripon-core.sciences] Multiple detection notification 20160609T	013745 UT	Fripon User	0	Jeudi 9 Juin 2016 04:00 CEST
[fripon-core.sciences] Multiple detection notification 20160609T	023938 UT	Fripon User	0	Jeudi 9 Juin 2016 05:00 CEST

Index of /data/multiple/20160609T023938_UT/TALENCE

Expediteur:	Fripon User <fripon@ceres.geol.u-psud.fr></fripon@ceres.geol.u-psud.fr>			
Date:	Jeudi 9 Juin 2016 05:00 CEST	Name	Last modified	Size Description
Destinataire:	fripon-core.sciences@u-psud.fr		and the second second second second	And a standard and a stand
Dánondro às	frinan cara sciancas@u neud fr	D ID		
An event has been	detected on 5 stations.	Parent Directory		-
Stations concerned :		DirMap.bmp	09-Jun-2016 04:39	900K
		GeMap.bmp	09-Jun-2016 04:39	301K
- TALENCE		TALENCE 20160609T02393	8 UT.jpg 09-Jun-2016 04:39	1.0M
- MAUROUX		B		
- DAX		Talence 201606091023944 U	JT.fit 09-Jun-2016 04:39	2.4M
- MARIGNY - COULOUNIEIX		fits2D/	09-Jun-2016 04:39	
		positions.txt	09-Jun-2016 04:39	2.9K
Data are going to /20160609T023938	be downloaded in /data/fripon/detections/multiple directory.	video.avi	09-Jun-2016 04:39	2.9M

20160609T023938 UT





FRIPON, What next?

- Finish the optical network => end of 2016
- Install the radio network (25 stations) => end of 2016
- Install the spectroscopic network (10 stations) => 2017
- Reduction pipe line (astrometry, orbits...)
- Extension of the network
- Data base
- VO event (Virtual Observatory)
- Extension of the network



ESO – Cerro Paranal



Fripon is also a Citizen Science programme Vigie-Ciel



Creation and dirtibution of physical outreach supports (kits,exhibits...) + On-line outreach media (movies, teasers, games)

1998



Forthcoming extensions of FRIPON in the frame Vigie-Ciel:

- Watching bats and migrating birds
- Knowing sky coverage at night (important for biologists who study nightlife)
- Monitoring spece debris

Simulating meteorite search campaigns

V ...

FRIPON: a scientific network

to reconstruct meteorite orbits

FRIP **N** 's strong points : ✓ Network density and coverage, conectivity Coupling cameras with detection of radio echoes \rightarrow precision on the orbits ✓ Low-cost and all open-source: easy to imitate \rightarrow the spread to Europe has already started Observation of meteors even when the incoming object doesn't reach the ground \rightarrow statistics

Coupled with a nanosat project: METEOR



Thanks for your attention





