

The Global Radio CAMs 2014

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Comet 209P/LINEAR stream

- May 24, 2014
- Radiant $\alpha = 122^\circ$ $\delta = +79^\circ$
- Little daily movement \rightarrow Observability Function not varying a lot
- Whole day coverage in Northern hemisphere
- Very slow (20 km/s with zenith attraction) \rightarrow cfr Draconids 2011

'Global' hourly counts

www.rmob.org

Home Download FAQ Links News Photos Stats

Live observations

- Live meteor observatory
- Daily Shower activity

RMOB Data

- RMOB Archives
 - Visual RMOB Archives
 - Archives in Text format
- Search Engine
 - RMOB full TXT Search engine

RMOB Tools

- Excel
 - RMOB Excel Sheet

Radio Meteor Observatory's On Line

Observer's list (by date/time last upload data) and location

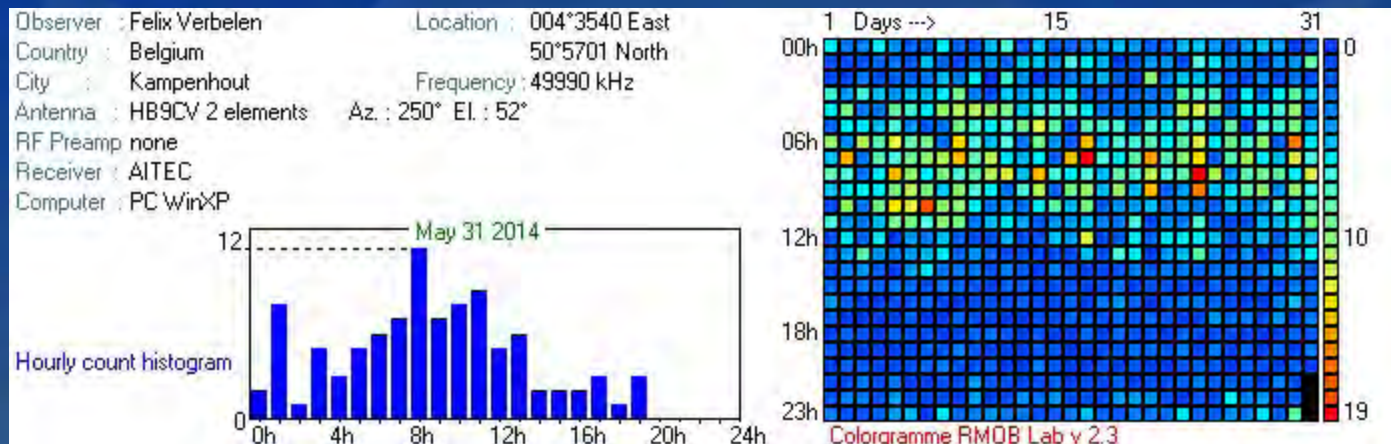
Observer list:

- Dave Jones
- SMRST Hvezdarna_Vsetin
- Maarten Vanleenhove
- HPHK
- OBSJAROMER
- OBSUPICE-R1
- ZVPP
- Istvan Tepliczky
- Kate Kay
- Naoya Saito
- Norman Lookyer_Observatory
- Radioastro Essen
- Jay Hainline_KA9CFD
- EK8RSC Haik_Saroyan
- Hirofumi Sugimoto_113
- Hirofumi Sugimoto_053
- Bob Mobile_K1SIX
- Fabio Moschini
- Cardeñosa David
- Adam Rawlinson
- Frederic Lucas
- Bill Ward
- Jeff Brower

Observer list (continued):

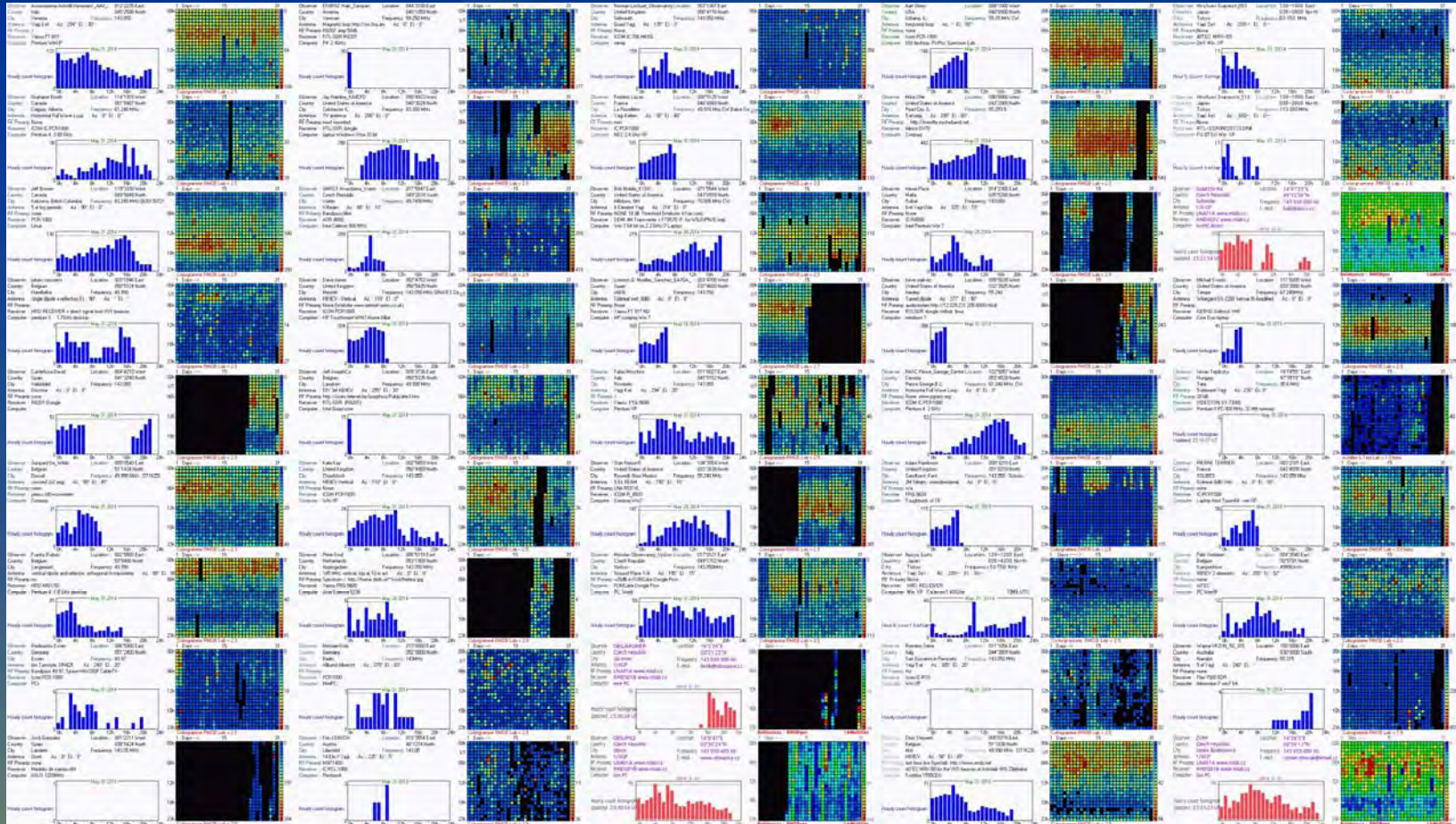
- Associazione Astrofili
- Veneziani_AAV_
- Grahame Booth
- Stan Nelson5
- Jeff JosephCo
- Romano Serra
- Bramond Philippe
- Gaspard De_Wilde
- Mate_(HG8_054) Pinter
- Chris Steyaert
- Johan coussens
- Joseph Gordon
- Fritz LENSCH
- Peter Knol
- Franky Dubois
- Mikhail Svoiski
- Felix Verbelen
- kevin pallivec
- Fernando Roque CT7ABI
- Alexei Pace
- Diego Rodriguez
- Kielder Observatory
- Remote_Station
- Mike Otte
- Ryumshin Igor

'Standard' graph of hourly counts

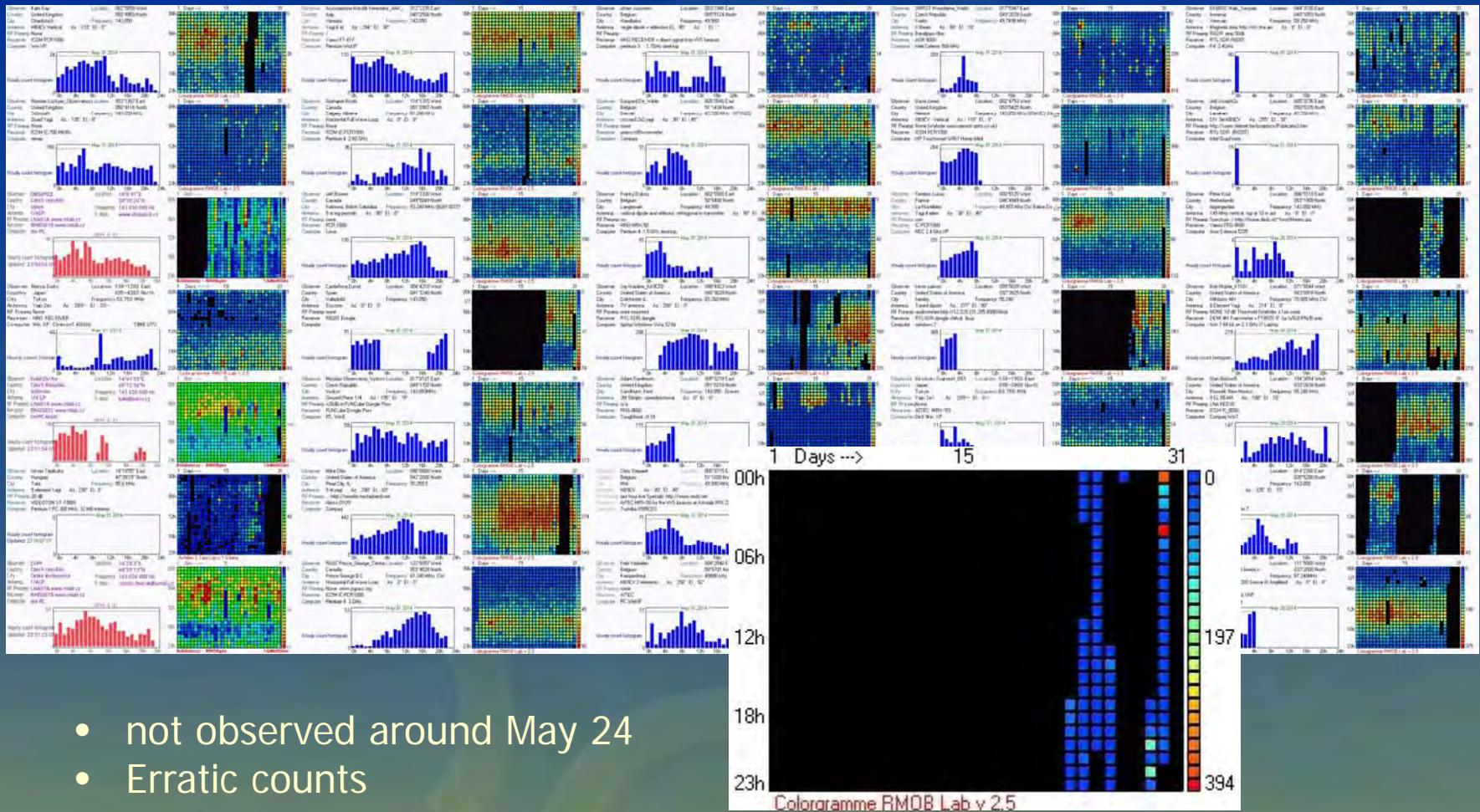


Daily pattern

All May 2014 observations (45)

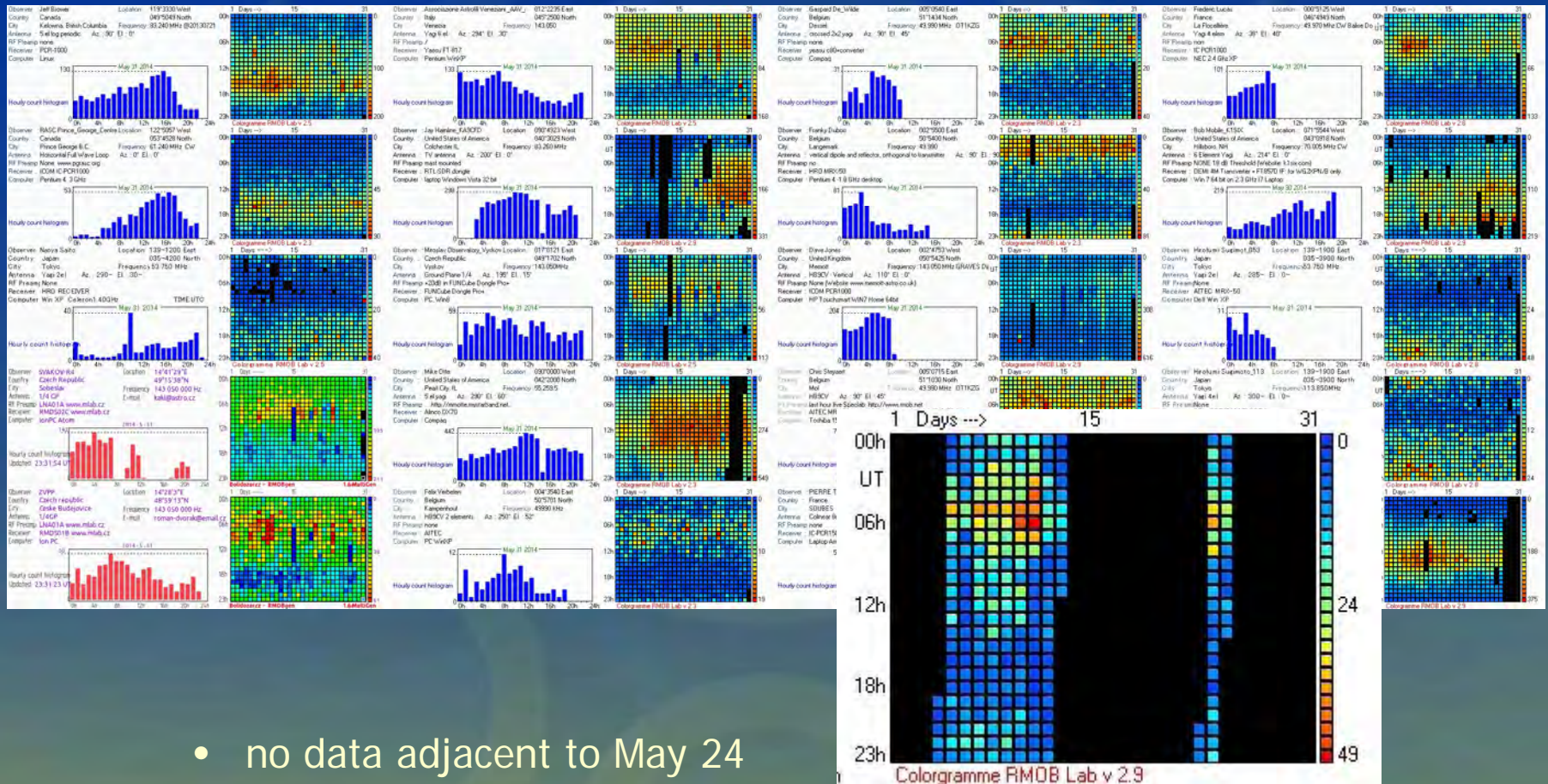


Eliminate (-10)



- not observed around May 24
- Erratic counts

Eliminate (-15)



- no data adjacent to May 24

Remaining observations (20)

Europe	11
North America	6
Japan	3

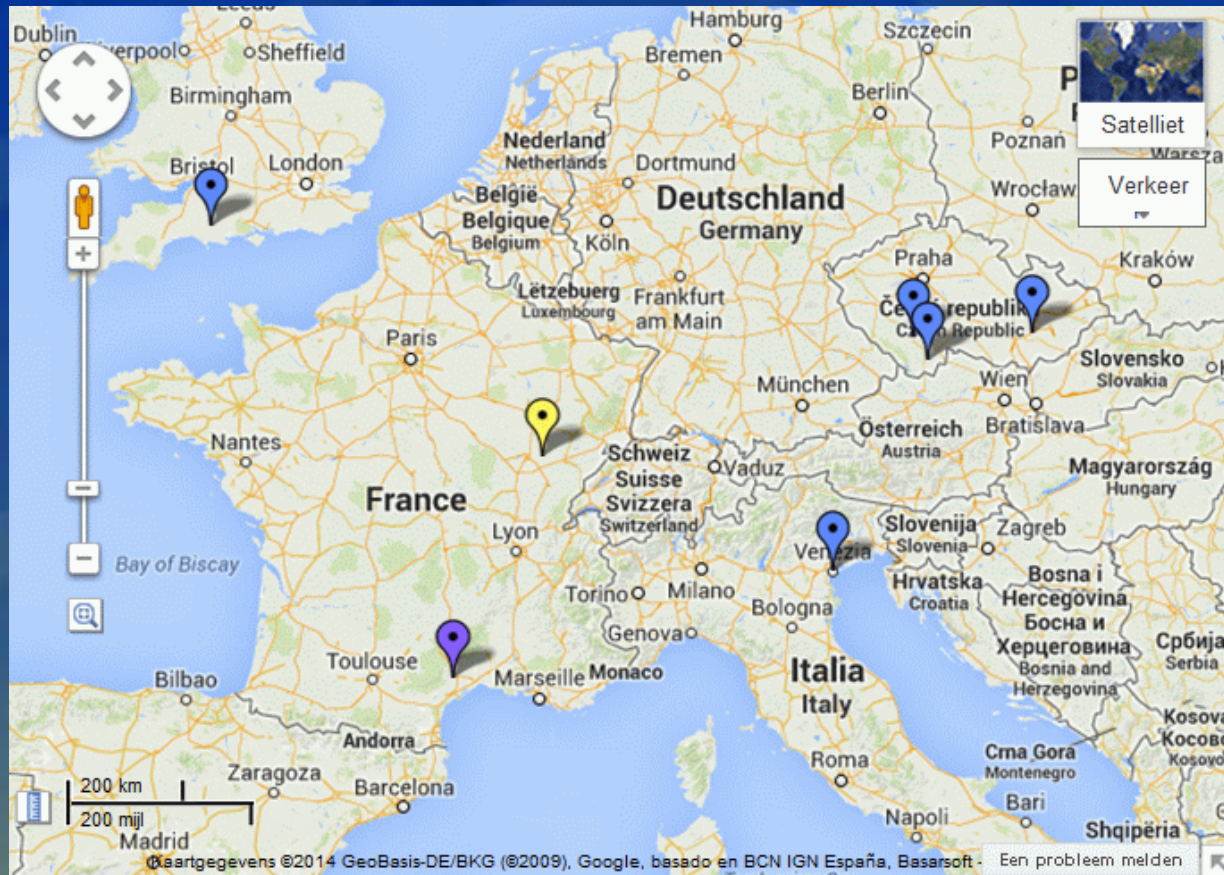
Europe	11
of which GRAVES	6



Grand Réseau Adapté à la
= Space debris tracking
Located near Dijon
Several MW, beam switch

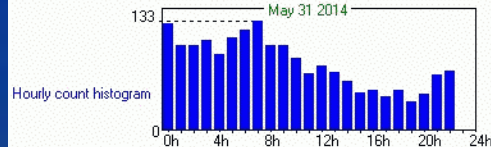


GRAVES + observers

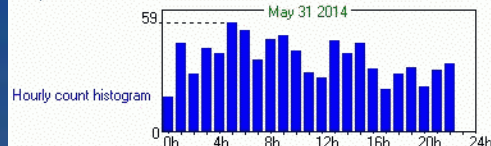


GRAVES May 2014 observations

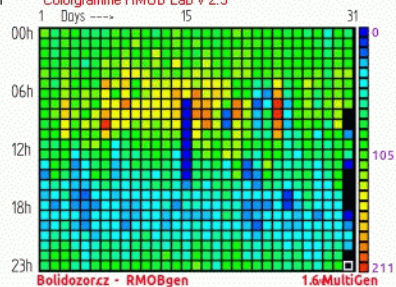
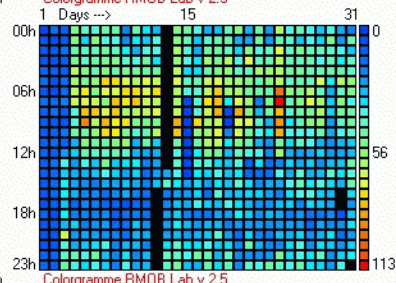
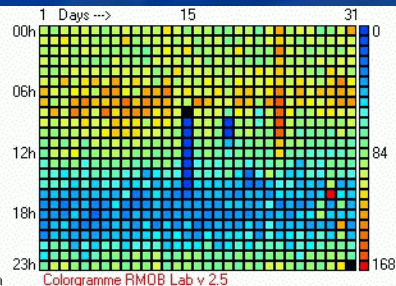
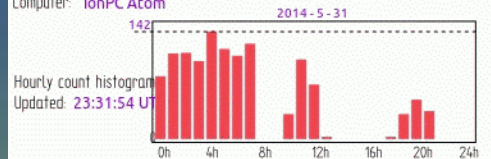
Observer : Associazione Astrofili Veneziani _AAV_ Location : 012°22'35" East
 Country : Italy 045°25'00" North
 City : Venezia Frequency : 143.050
 Antenna : Yagi 6 el Az. : 294° EL : 30°
 RF Preamp /
 Receiver : Yaesu FT-817
 Computer : Pentium WinXP



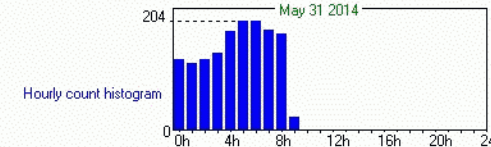
Observer : Miroslav Observatory_Vyskov Location : 017°01'21" East
 Country : Czech Republic 049°17'02" North
 City : Vyskov Frequency : 143.050MHz
 Antenna : Ground Plane 1/4 Az. : 195° EL : 15°
 RF Preamp +20dB in FUNCube Dongle Pro+
 Receiver : FUNCube Dongle Pro+
 Computer : PC, Win8



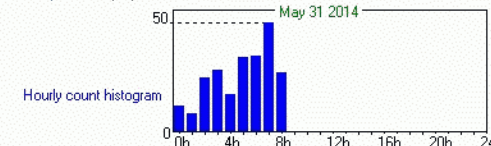
Observer : SVAKOV-R4 Location : 14°41'29"E
 Country : Czech Republic 49°15'38"N
 City : Sobeslav Frequency : 143 050 000 Hz
 Antenna : 1/4 GP E-mail : kakl@astro.cz
 RF Preamp LNA01A www.mlab.cz
 Receiver : RMD502C www.mlab.cz
 Computer : IonPC Atom



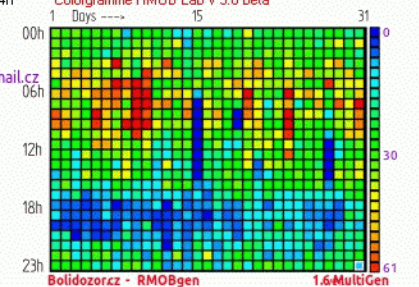
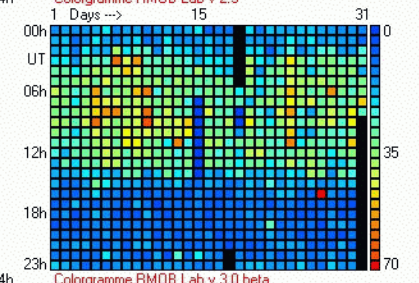
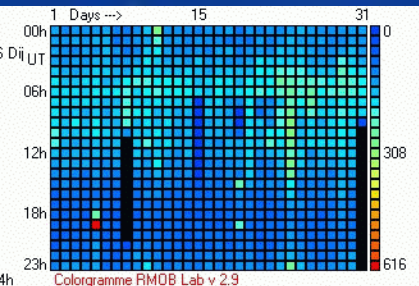
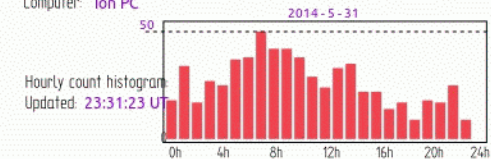
Observer : Dave Jones Location : 002°47'53" West
 Country : United Kingdom 050°54'25" North
 City : Merriott Frequency : 143.050 MHz GRAVES Dij UT
 Antenna : HB9CV - Vertical Az. : 110° EL : 0°
 RF Preamp None (Website www.merriott-astro.co.uk)
 Receiver : ICOM PCR1000
 Computer : HP Touchsmart WIN7 Home 64bit



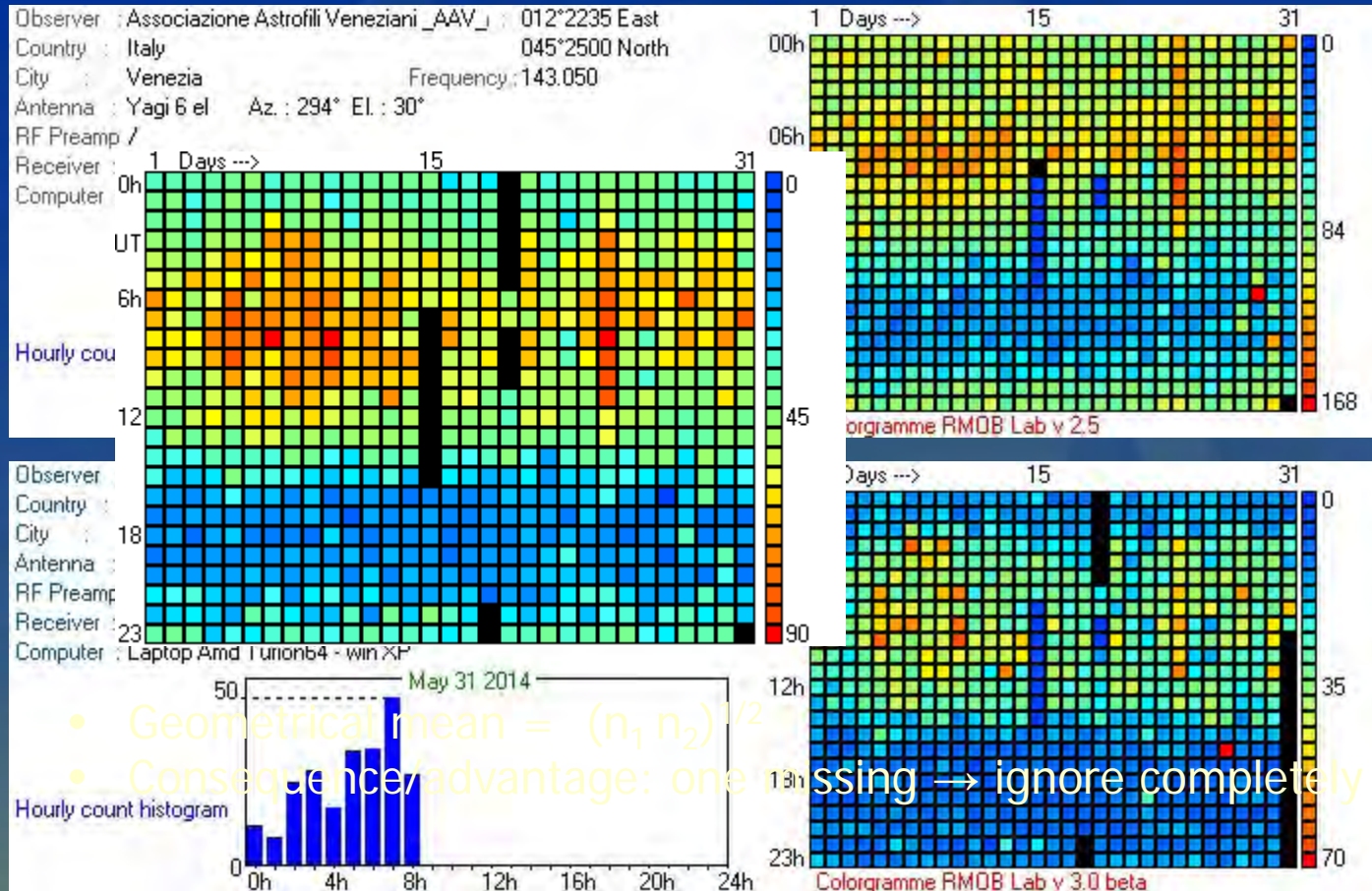
Observer : PIERRE TERRIER Location : 003°21'01" East
 Country : France 043°45'58" North
 City : SOUBES Frequency : 143.050 Mhz
 Antenna : Colinear 8dBi Vert. Az. : 0° EL : 90°
 RF Preamp none
 Receiver : IC-PCR1500
 Computer : Laptop Amd Turion64 - win XP



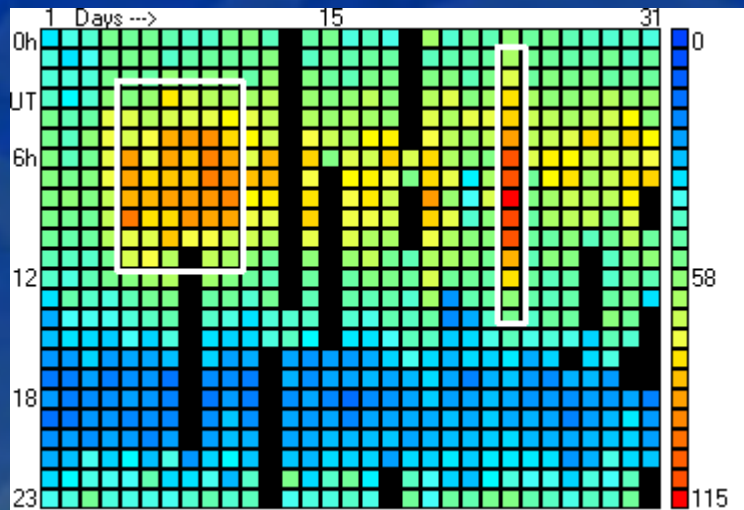
Observer : ZVPP Location : 14°28'3"E
 Country : Czech republic 48°59'13"N
 City : Ceske Budejovice Frequency : 143 050 000 Hz
 Antenna : 1/4GP E-mail : roman-dvorak@email.cz
 RF Preamp LNA01A www.mlab.cz
 Receiver : RMD501B www.mlab.cz
 Computer : Ion PC



Combining GRAVES 2 observations

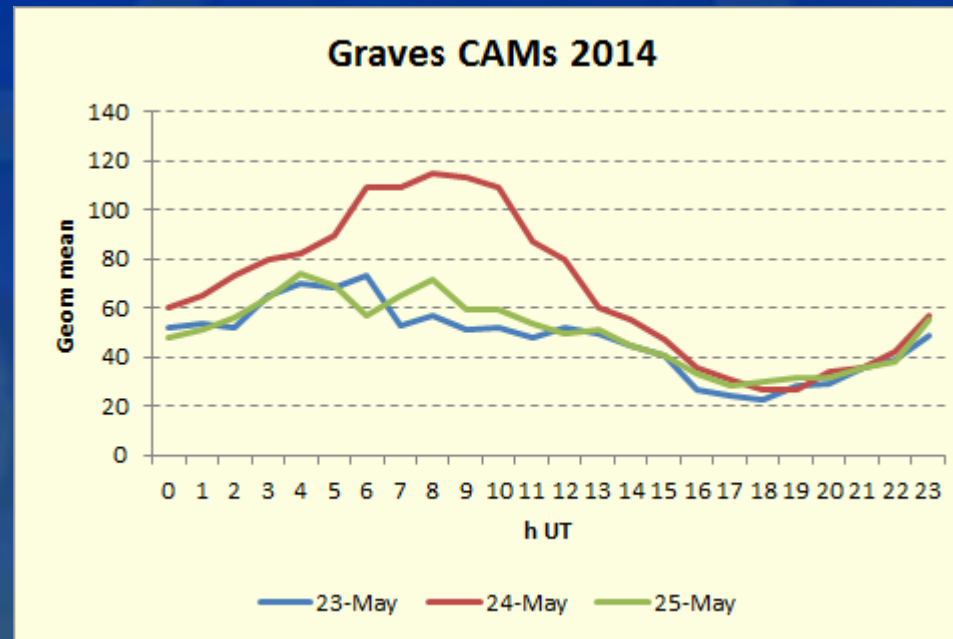


Combining GRAVES 6 observations



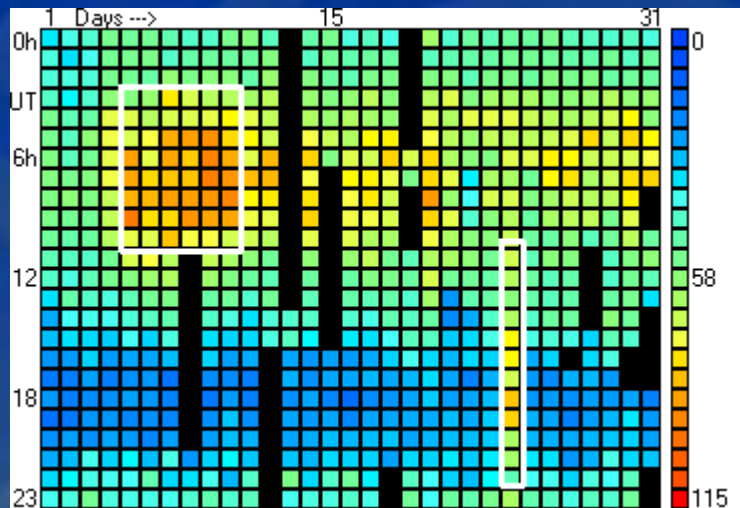
- Geometrical mean = $(n_1 n_2 \dots n_6)^{1/6}$
- Observed 1h UT to 13h UT
- Peak 7 – 8 h UT
- Stronger than eta Aquarids?

Combining GRAVES 6 observations



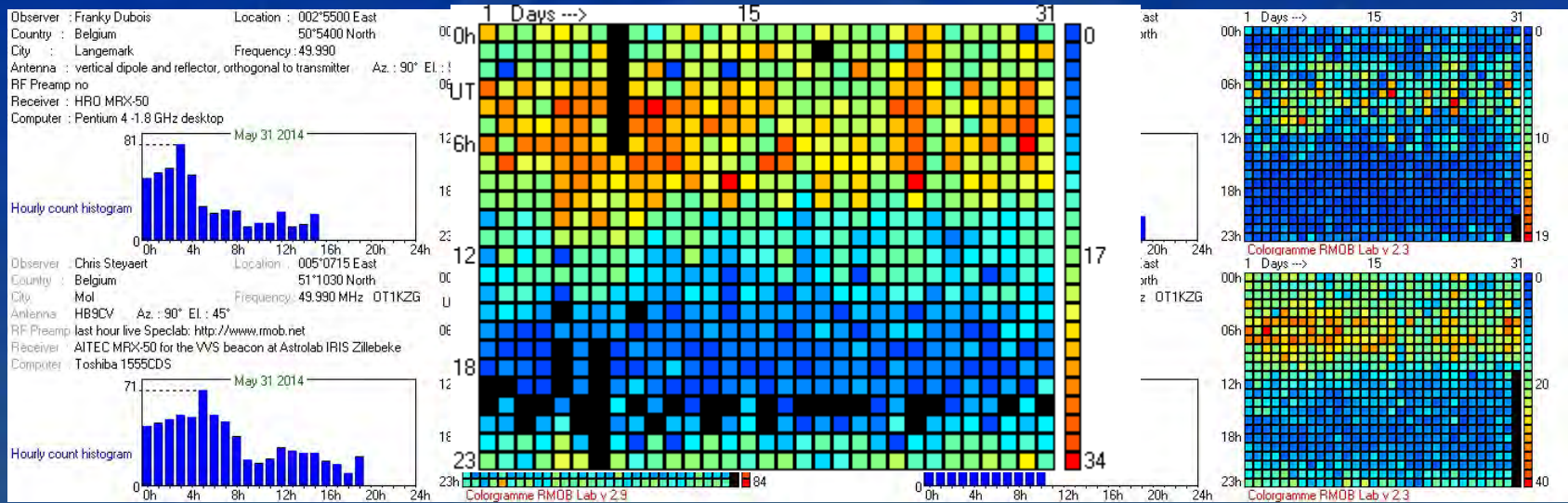
- Time domain

Simulation GRAVES 6 observations



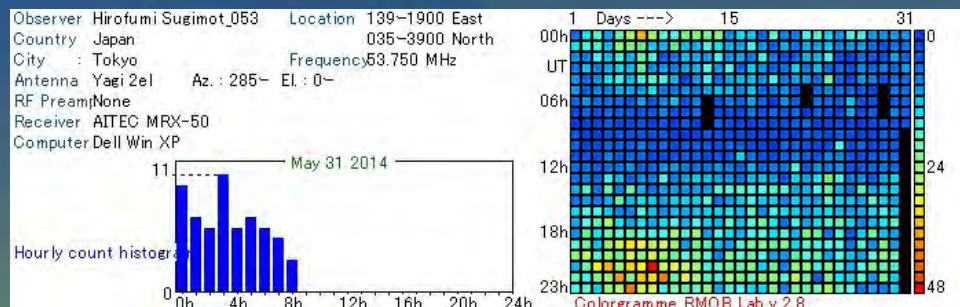
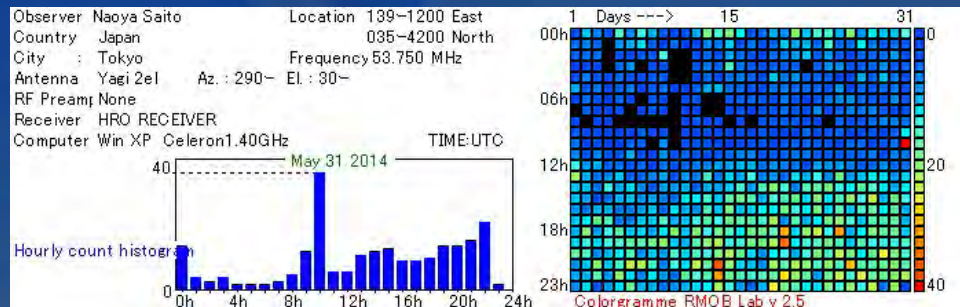
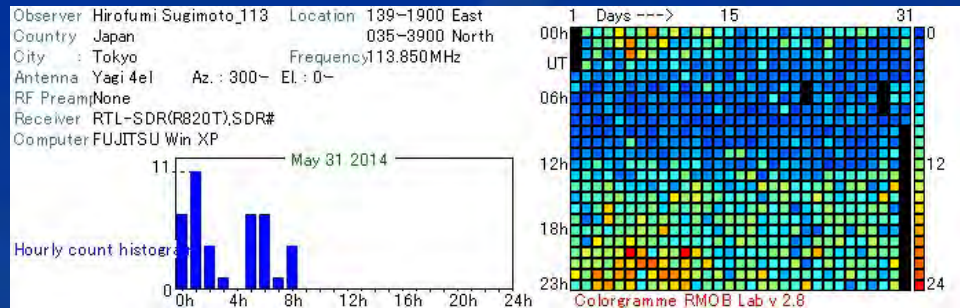
- Simulated 11 h UT to 23h UT
- Simulated Peak 17 – 18 h UT
- Lower than eta Aqr, but more conspicuous

VVS beacon 4 observations



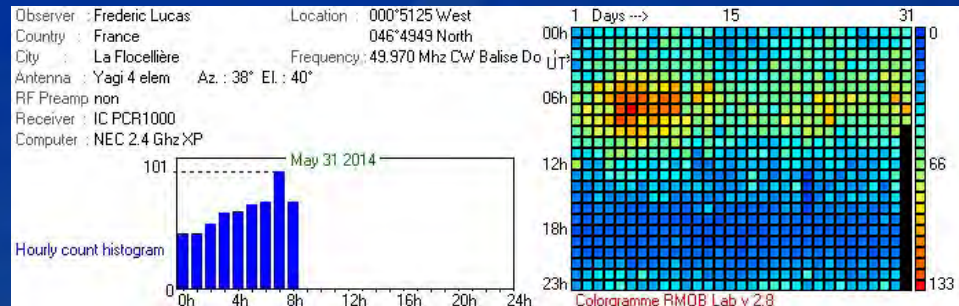
- Low power (50 W), observers 10 to 120 km from transmitter
- Verbelen: overdense only, low number
- CAMs visible, but less pronounced

Japan 3 observers

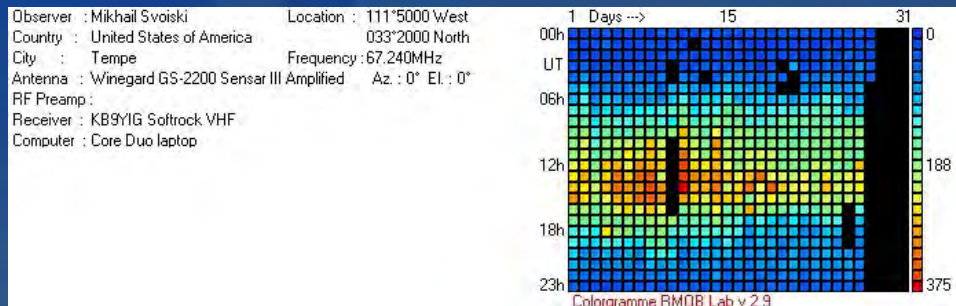


- Hardly seen
- Why?

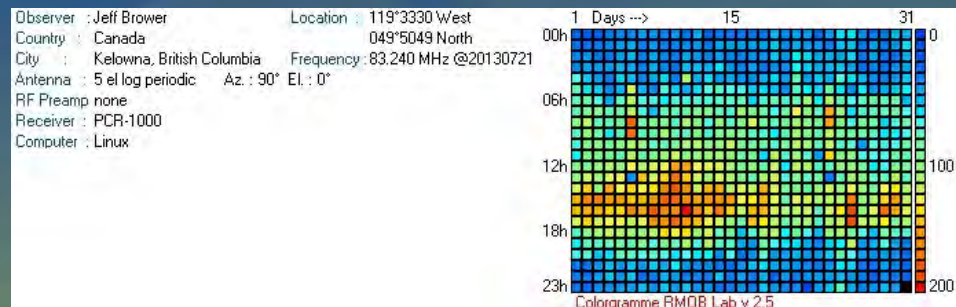
Single observers



- BIRA beacon 250 W
- Observer 500 km SW
- positive

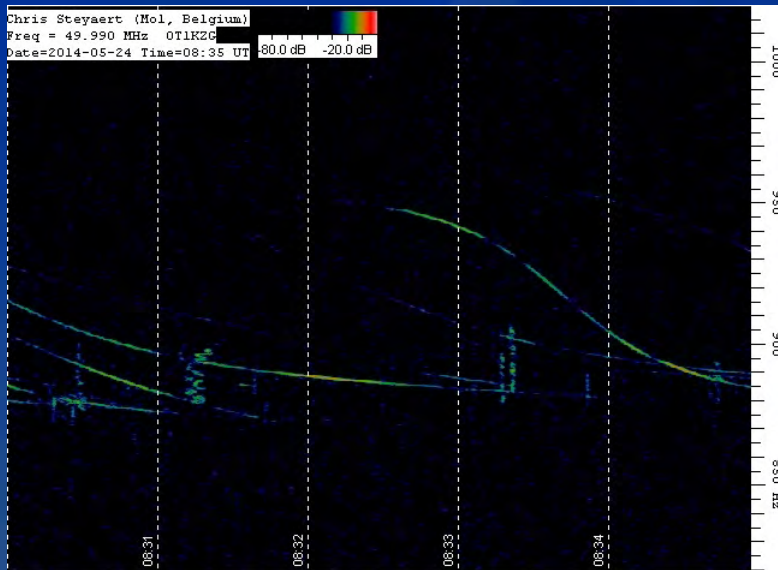


- Reference observer last 2 years
- hardly seen



- Jeff
- yes

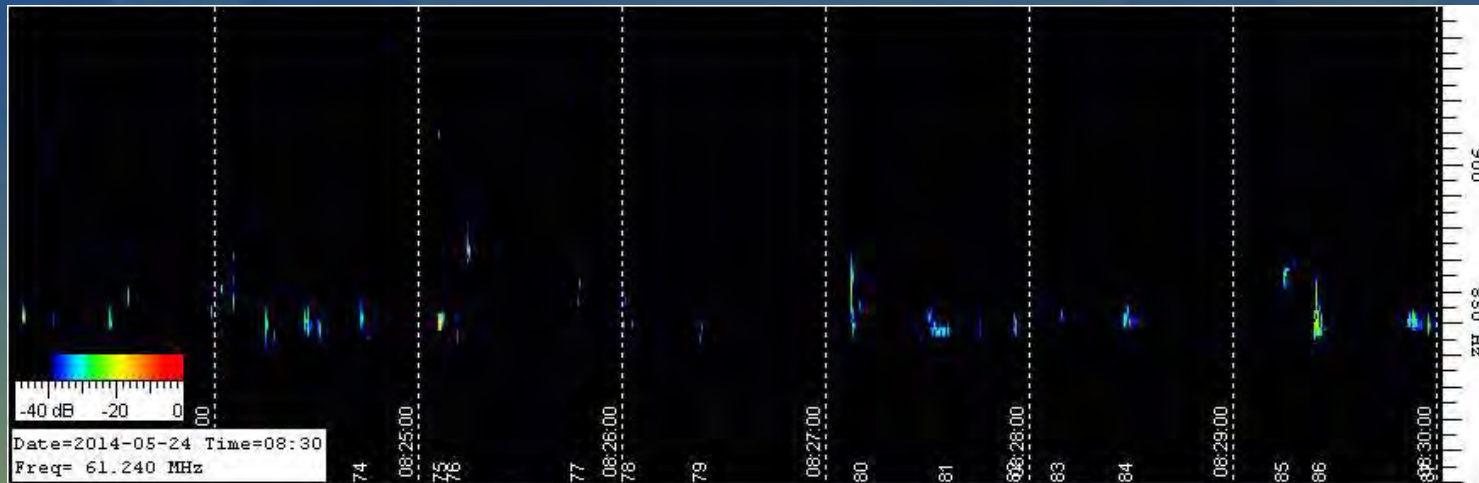
Detailed reflections



'epsilon's

Chris

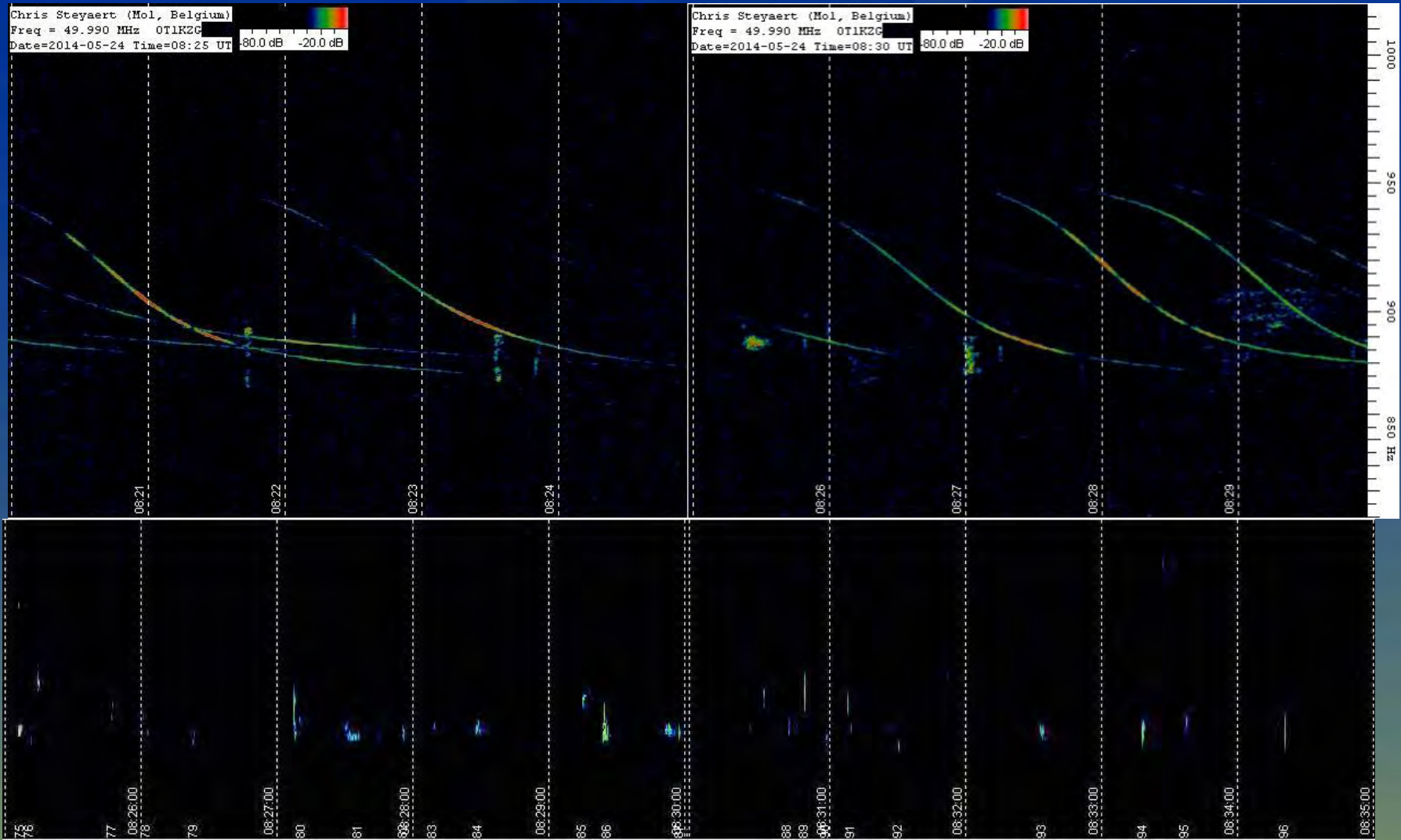
Jeff



Giron September 2014

VVS Chris Steyaert

Detailed reflections

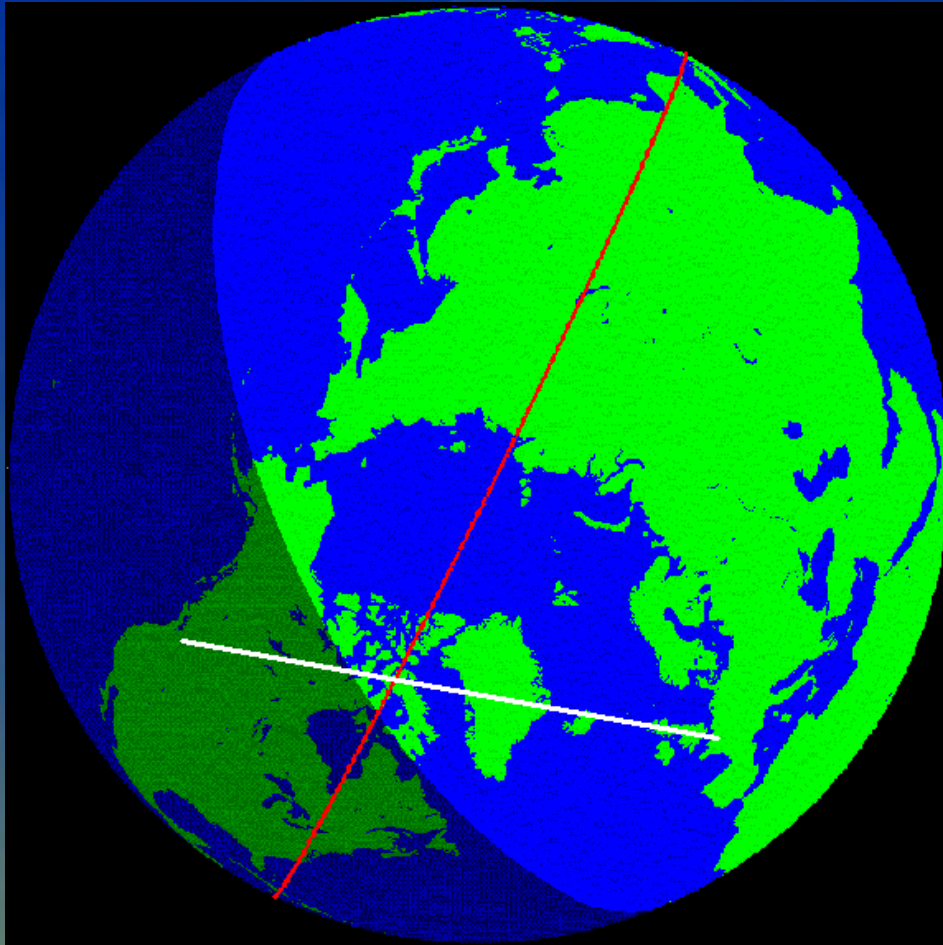


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VVS Chris Steyaert

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Stream arrival geometry

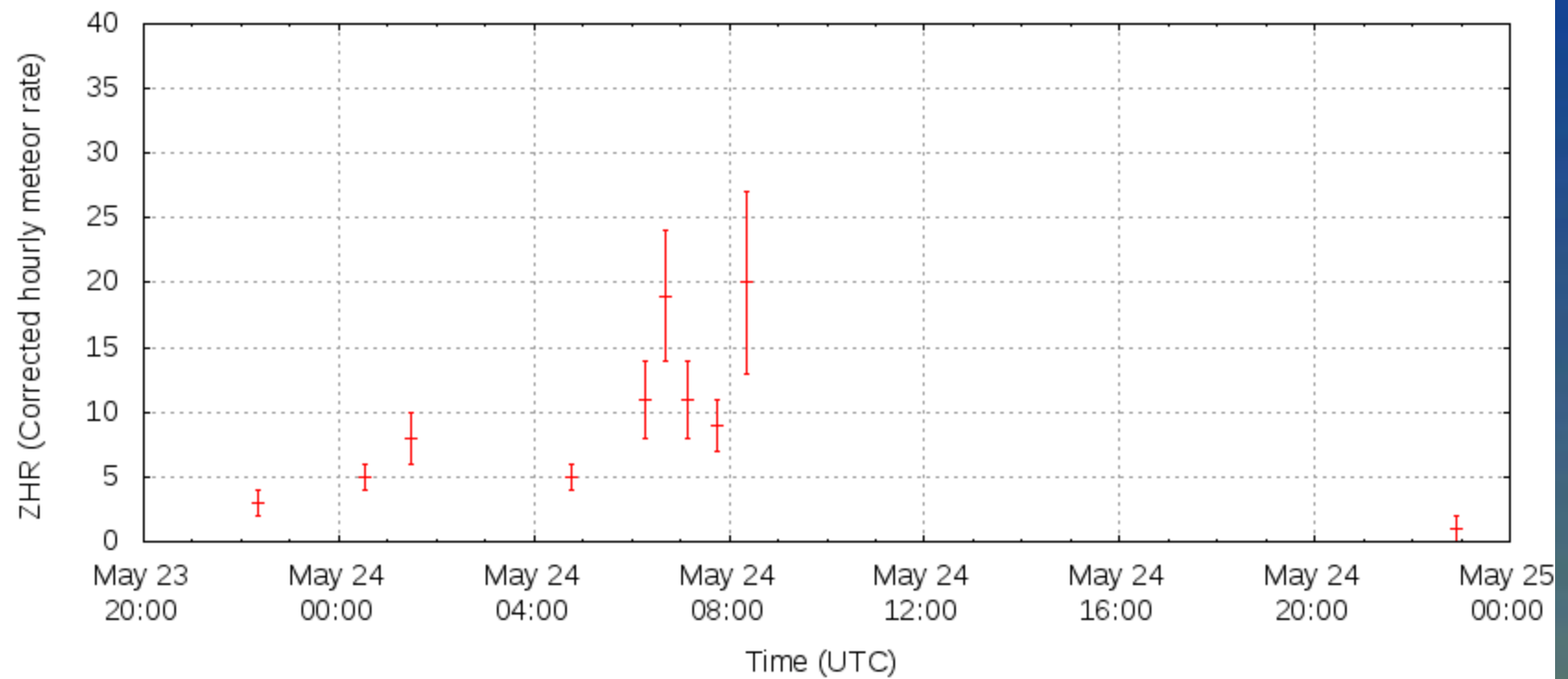


Width (horizontal)
 ≈ 8000 km

Diff travel time
(orthogonal)
 < 1 min

Visual comparison

<http://www.imo.net/live/comeleopardalids2014/>



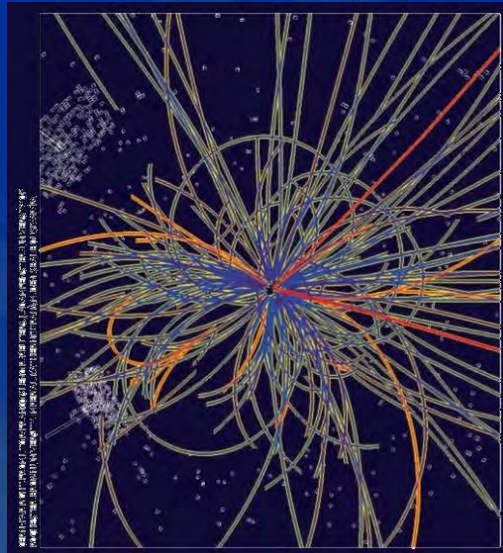
Conclusion

CAMs activity detected with forward scatter observations

Most succesful: Graves automated counts

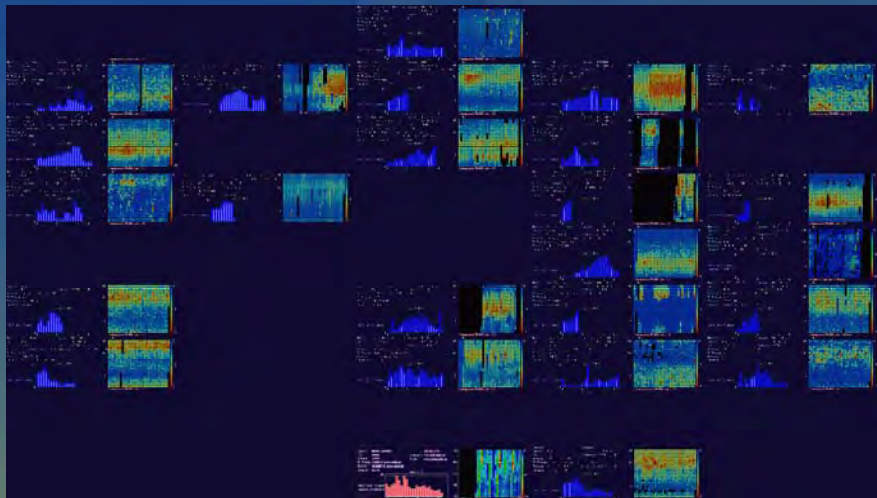
Activity period of smaller particles: May 24, 1h – 13h UT

Peak activity and larger particles: May 24, 7h – 9 h UT

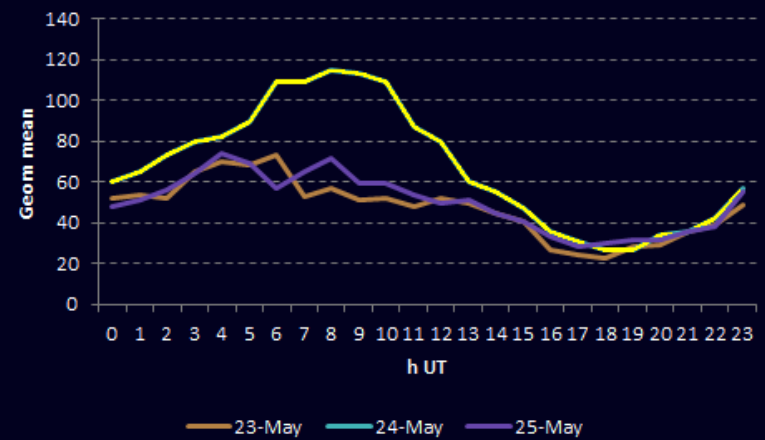


PARTICLE FOUND

Measuring the momentum of photon pairs produced in collisions at the Large Hadron Collider revealed a suspicious bump - one line of evidence for a new particle



STREAM FOUND



Thanks to / acknowledgments

- The `rmob.org` contributors
- Pierre Terrier
- Jeff Brower
- (meteorobs) mailing list
- IMO

- A GRAVES Sourcebook
- Mikhail Maslov Fig. 3. The Earth as seen from coming 209p-ids meteors