Global Radio η Aquarids 2013

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Dust Trail of Eta Aquariids in 2013

Date: Sat, 04 May 2013 14:15:42 +0900

Sat, 04 May 2013 Mikiya Sato

To: Meteor science and meteor observing <meteorobs@meteorobs.org>

Subject: (meteorobs) **Dust Trail of Eta Aquariids in 2013**

I found out that the old dust trails of Eta Aquariids (ETA) will approach the earth in 2013.

Dear all,

Date(UT)   May.06 05:45 - May.06 21:19

I am Mikiya Sato.

I found out that the old dust trails of Eta Aquariids (ETA) will approach the earth in 2013.

The peak may be continuous or broader because distribution of the old dust has spread.

The outline is as follows.

I expect that they are about 2 times of the usual activity at the maximum because this case is similar to Orionids from 2006 to 2010.

Trail	Date(UT)		λ⊙	ΔaO	fM
-910	May.06 05:45	45.687	-0.0038	-2.12	0.095
-910	May.06 06:27	45.710	-0.0017	-2.11	0.017
-1197	May.06 12:37	45.959	+0.0021	+3.44	0.013
-1197	May.06 21:19	46.321	+0.0021	+4.19	0.014

Detection of the increase is not easy since observation condition of ETA is not so good in the Northern Hemisphere.

In addition, -1403, -1333, -1265, -1128, -985, and -835 trail also tend to approach the earth.

The peak may be continuous or broader because distribution of the old dust has spread.

But, the increase in the number of meteors is unknown about ETA.

I expect that they are about 2 times of the usual activity at the maximum because this case is similar to Orionids from 2006 to 2010.
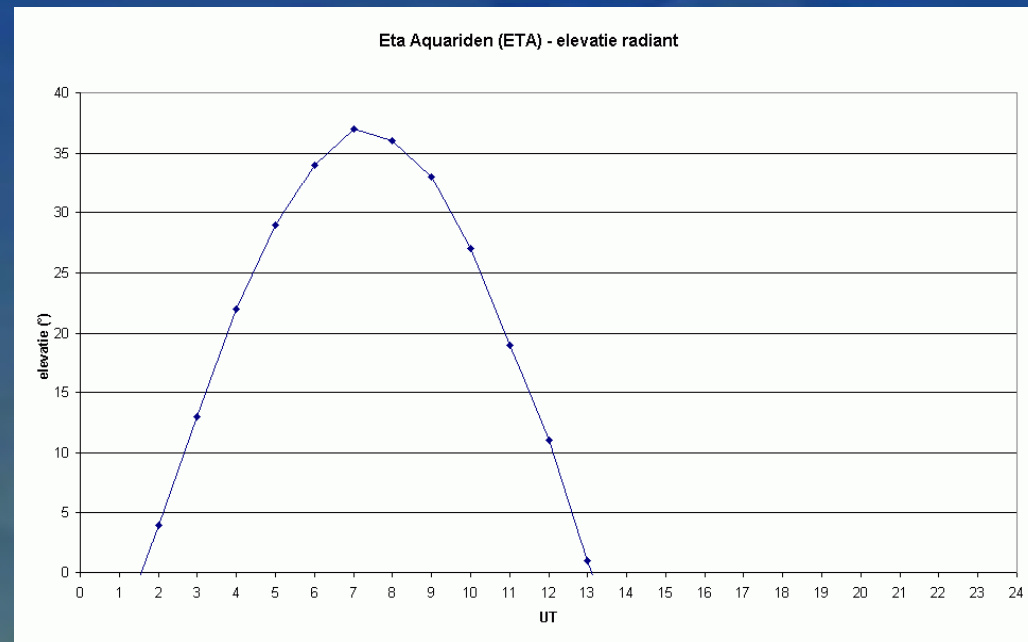
Detection of the increase is not easy since observation condition of ETA is not so good in the Northern Hemisphere.

However, please take notice of the appearance this year.

η Aquarids stream

- Radiant   α = 336 ° δ = -2 °
- Daily path for λ = 5 °, β = 51 °

- Fast (66 km/s) →
  less interesting for
  radio work

- Radio observations
  of previous years

Eta Aquariden (ETA) - elevatie radiant

'Global' hourly counts

May 2013

Observer : Felix Verbelen   Location : 004°3539 East
Country   : Belgium   050°5701 North
City   : Kampenhout   Frequency : 49.99 MHz
Antenna   : 2-elements HB9CV Yagi Az. : 250° El. : 52°
RF Preamp none
Receiver : ICOM-R75
Computer : PC-Pentium III

Colorgramme RMOB Lab v 2.3
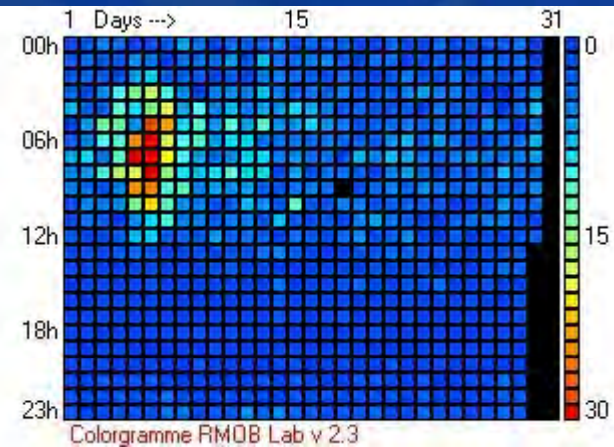

Observer : Mikhail Svoiski   Location :. 111°0000 West
Country   : United States of America   033°0000 North
City   : Tempe   Frequency : 67.240
Antenna   : Winegard GS-2200 active dipole   Az. : 0° El. : 0°
RF Preamp :
Receiver : KB9YIG Softrock VHF Ensemble
Computer : Compaq Armada M700

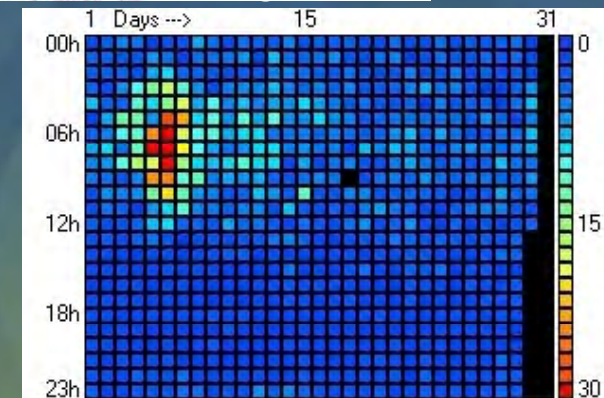Colorgramme RMOB Lab v 2.3
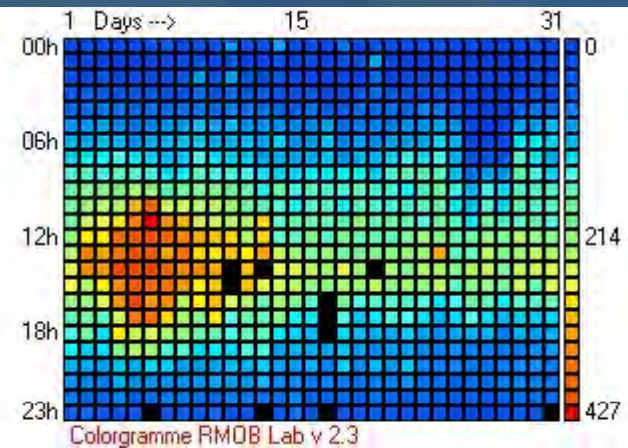
Patterns in function of counts

- number of 'random' events → Poisson distribution applies
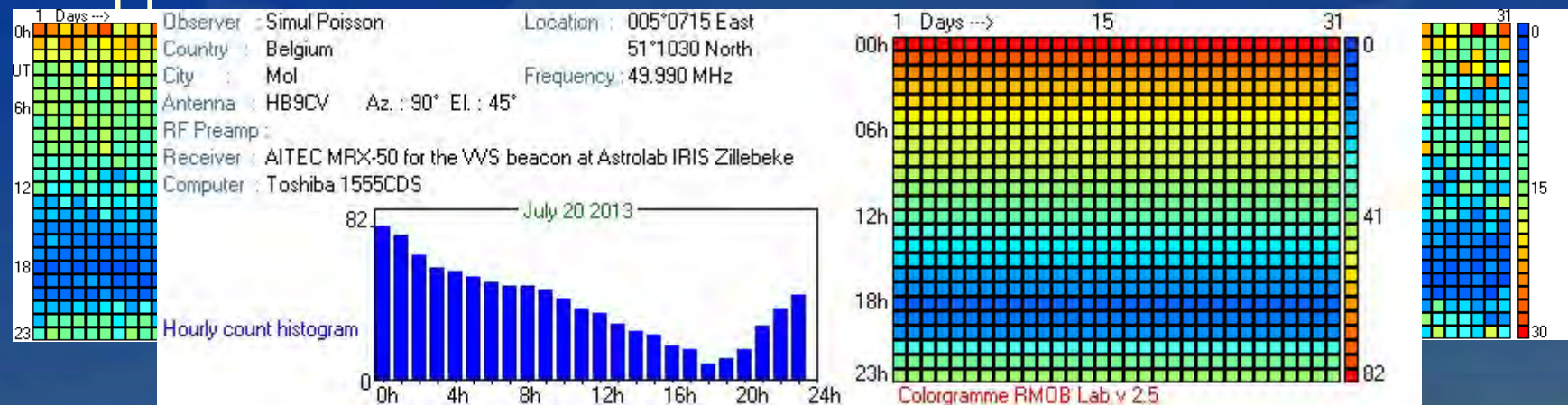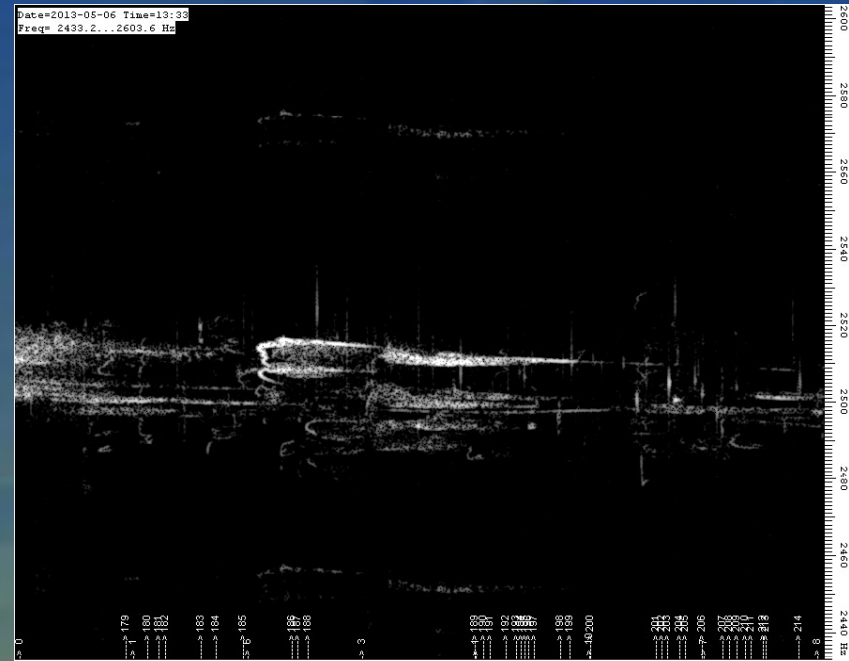

Verbelen May 2013

Details May 5 - 6

Svoiski

Automatic count?
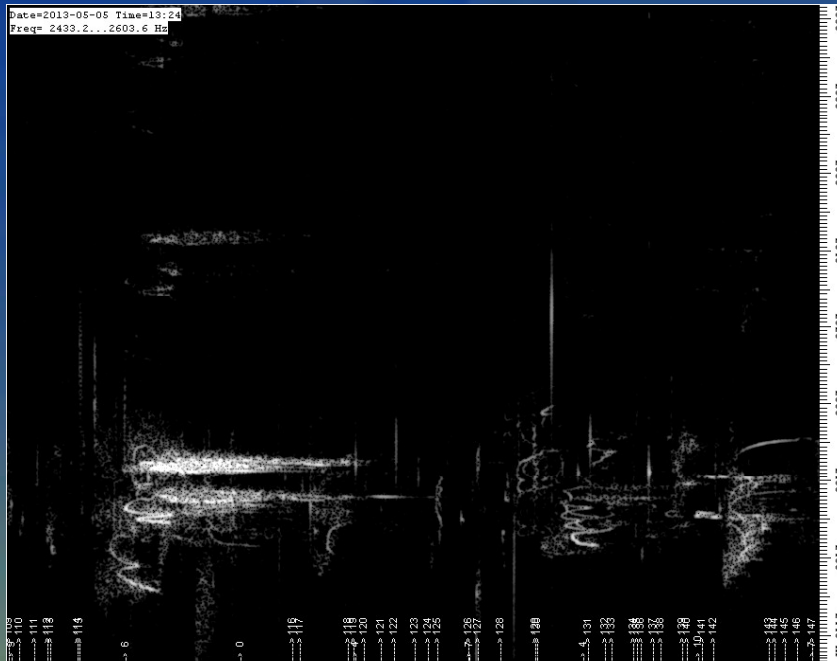
Stability of radio counts

49.99 MHz - Radiometeoren - dagtotalen
overdense reflecties
Felix Verbelen (Kampenhout)
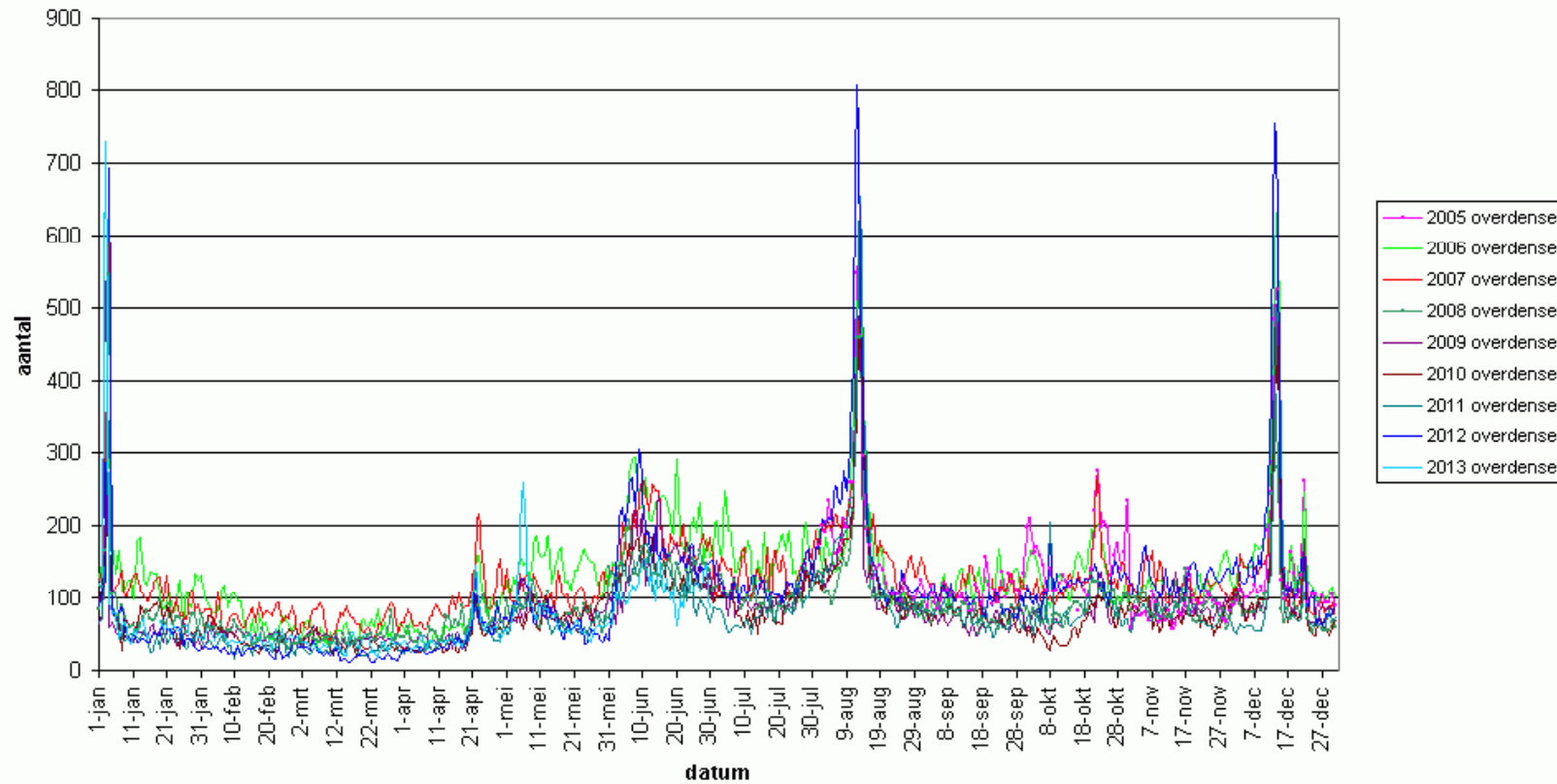
Modelling stream activity

$$O(t) = S(T) + Z(t)OF(T)$$

$$T = \frac{t - t_0}{D}$$

$$Z(t) = e^{-(t-t_M)/a}$$

$$Z(t) = e^{-(t_M-t)/b}$$

O	observed 'activity'
S	sporadic background
Z	stream profile
OF	Observability Function
t_M	instance of maximum
a	rise time constant
b	decay

Applied to Verbelen η Aqr 2013
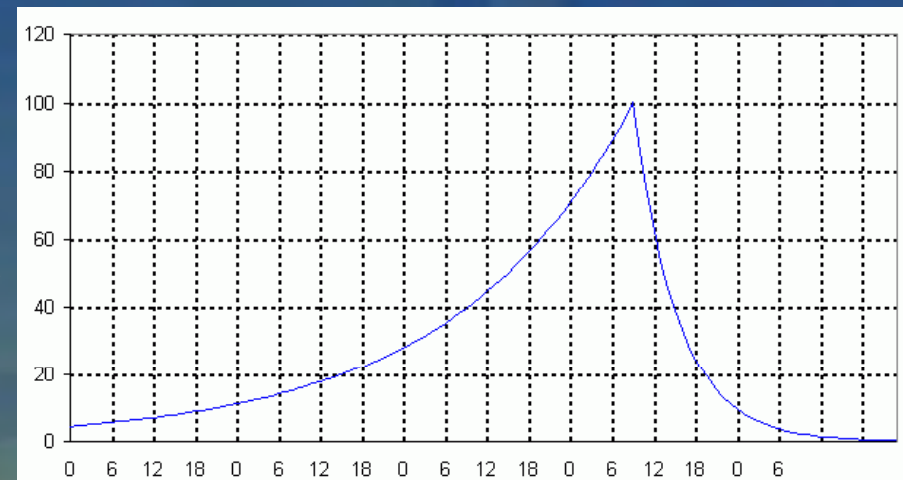
Felix Verbelen η Aqr 2013
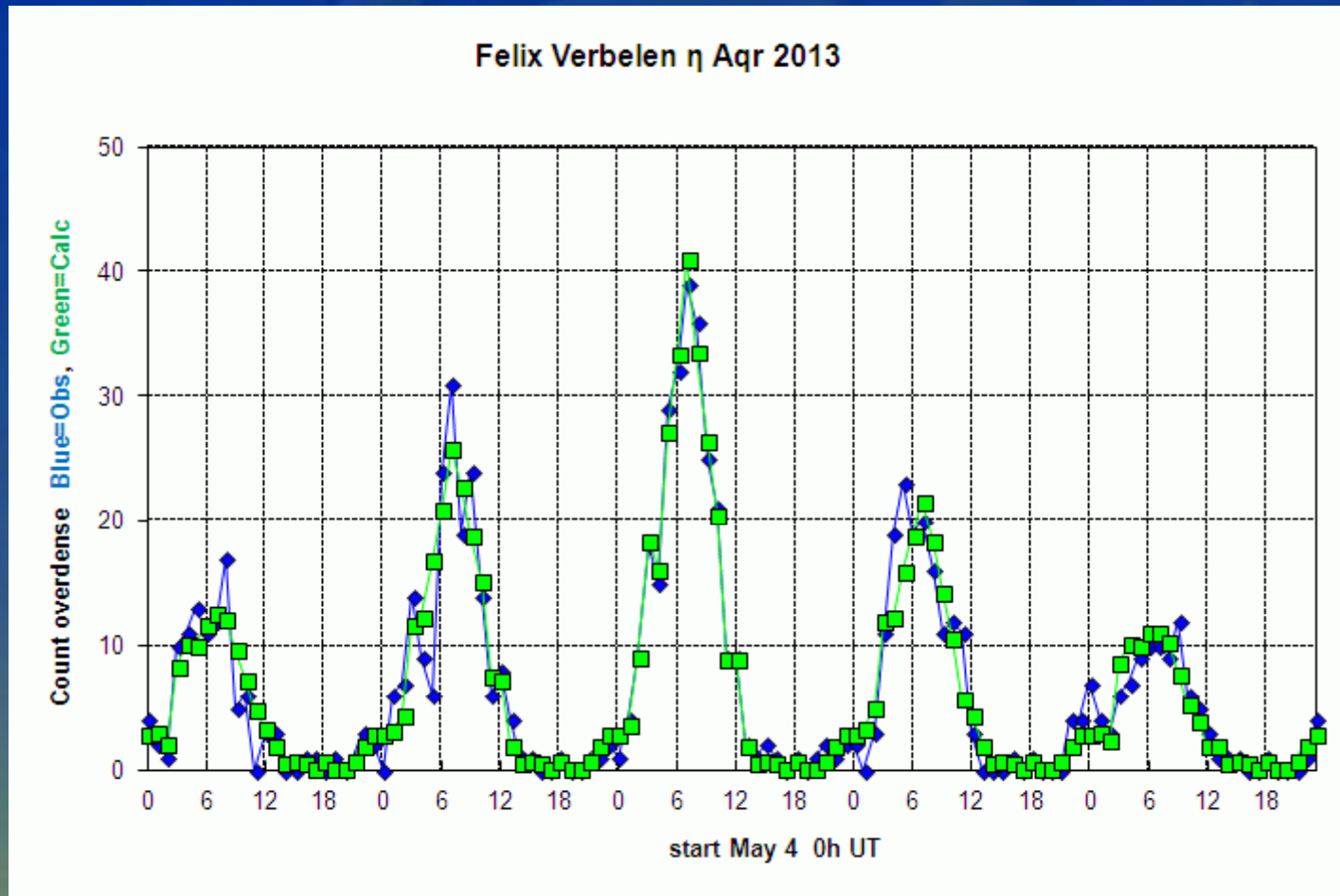
Applied to Verbelen η Aqr 2013

Verbelen η Aqr 2013
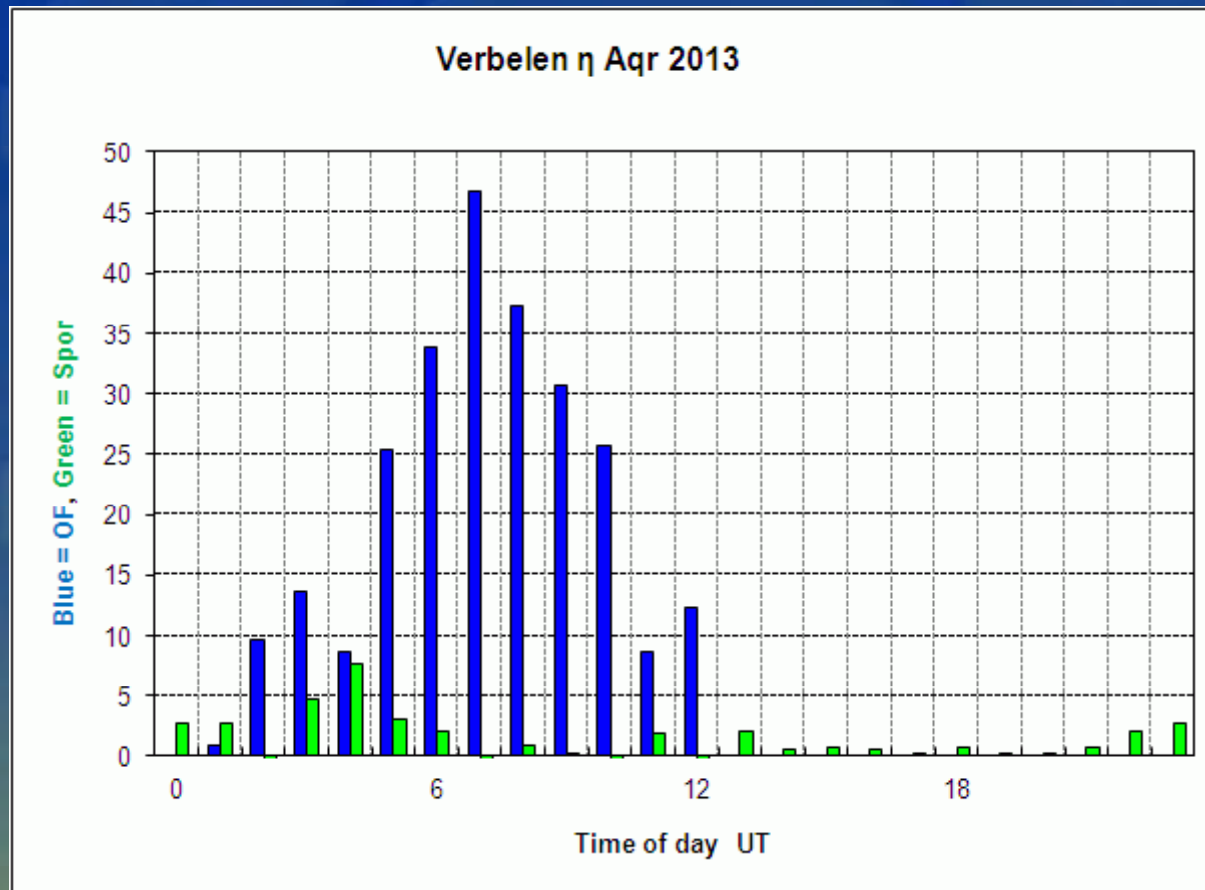
Maximum location
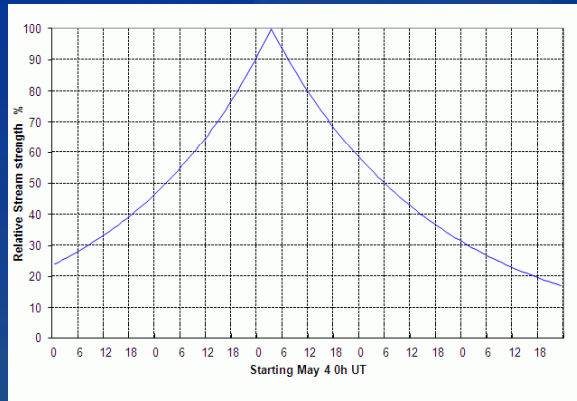
Verbelen:

t_M = May 6, 3.4 h UT +- 4h
a = 36 +-7 h , b = 39 +-9 h (asymetric?)

Observed maximum May 6, 7 h UT
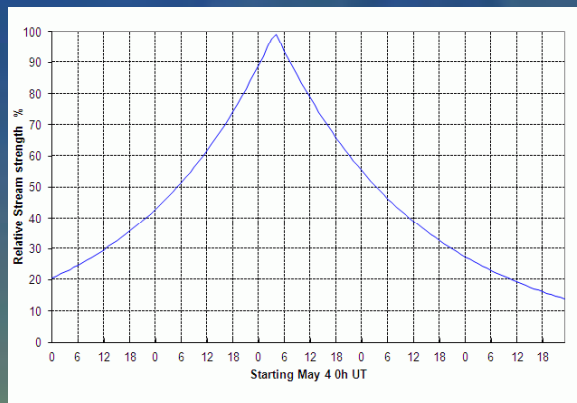
Svoiski:

t_M = May 6, 4.0 +- 2.5 h UT
a = 33 +- 8 h, b= 34 +-10 h

Observed maximum May 6, 11 h UT

Visual comparison

http://www.imo.net/live/eta-aquariids2013/

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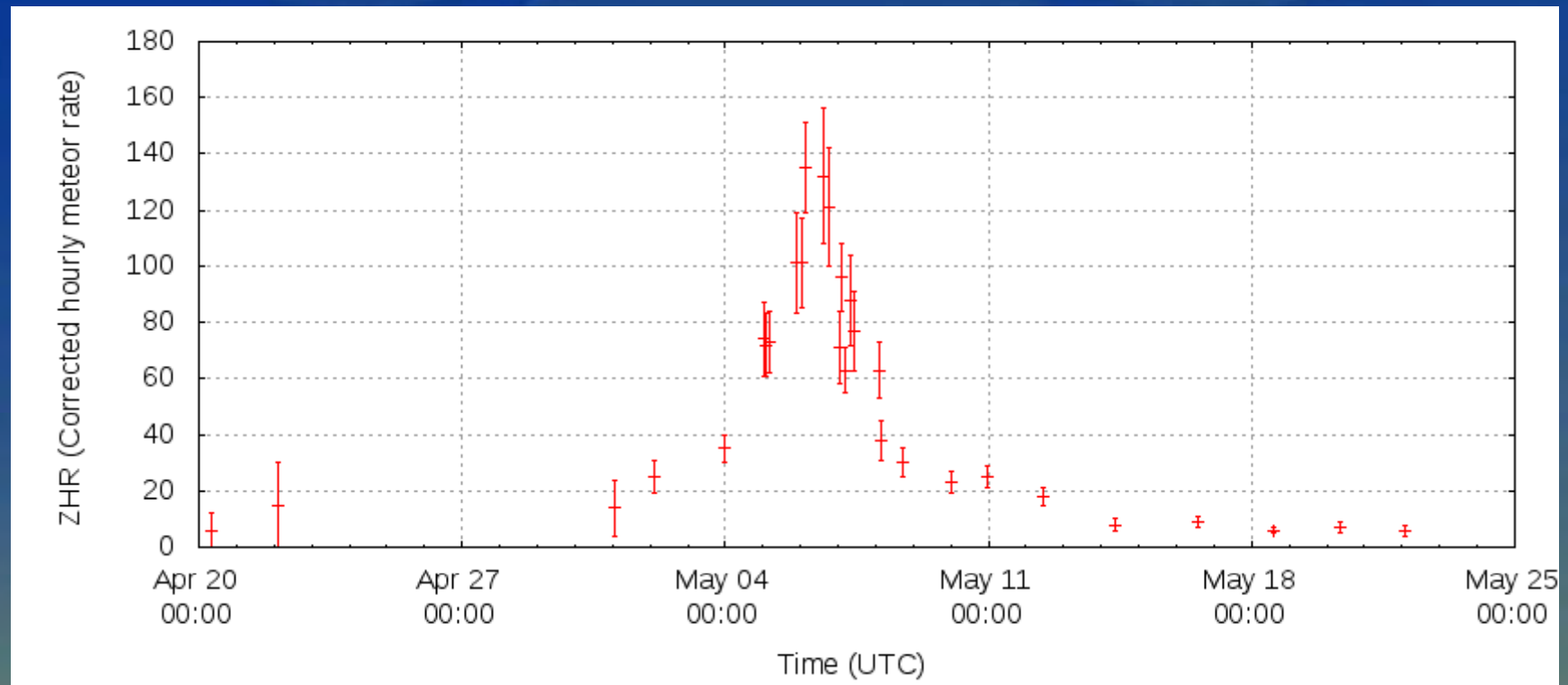
Time (UTC)	Solarlon	nINT	nETA	ZHR		Particle density
2013-04-20 07:52	30.215	2	0	6	±6	11 / $10^9 \cdot km^3$
2013-04-22 02:10	31.934	2	0	15	±15	27 / $10^9 \cdot km^3$
2013-05-01 01:58	40.680	1	1	14	±10	25 / $10^9 \cdot km^3$
2013-05-02 02:11	41.660	5	19	25	±6	46 / $10^9 \cdot km^3$
2013-05-03 23:27	43.489	10	40	35	±5	64 / $10^9 \cdot km^3$
2013-05-05 00:15	44.490	9	31	74	±13	135 / $10^9 \cdot km^3$
2013-05-05 01:36	44.545	6	43	72	±11	131 / $10^9 \cdot km^3$
2013-05-05 04:16	44.652	3	42	73	±11	133 / $10^9 \cdot km^3$
2013-05-05 21:56	45.366	6	31	101	±18	184 / $10^9 \cdot km^3$
2013-05-06 01:05	45.493	10	41	101	±16	184 / $10^9 \cdot km^3$
2013-05-06 02:45	45.560	6	67	135	±16	246 / $10^9 \cdot km^3$
2013-05-06 15:06	46.059	4	30	132	±24	240 / $10^9 \cdot km^3$
2013-05-06 18:11	46.183	3	32	121	±21	220 / $10^9 \cdot km^3$
2013-05-07 01:06	46.462	11	30	71	±13	129 / $10^9 \cdot km^3$
2013-05-07 02:20	46.512	8	68	96	±12	175 / $10^9 \cdot km^3$
2013-05-07 04:29	46.598	12	61	63	±8	115 / $10^9 \cdot km^3$
2013-05-07 08:28	46.759	4	30	88	±16	160 / $10^9 \cdot km^3$
2013-05-07 10:19	46.833	3	31	77	±14	140 / $10^9 \cdot km^3$
2013-05-08 01:50	47.459	5	36	63	±10	115 / $10^9 \cdot km^3$
2013-05-08 03:48	47.539	4	32	38	±7	69 / $10^9 \cdot km^3$
2013-05-08 16:51	48.065	5	31	30	±5	55 / $10^9 \cdot km^3$
2013-05-09 23:45	49.311	11	30	23	±4	42 / $10^9 \cdot km^3$

Eta Aquariids in Japan (May 6)

From IMO web, it seems that two peaks of ETA were observed. The first peak time was about 3h on May 6. Probably, this was formed by -910 trail.

Similarly, the 2nd peak about 15h was caused by -1197 trail.

However, these two peaks might be continuous.

And, the outburst lasted about 2 days or more. This may mean that distribution of dust had spread because two or more kind of dust trails approached.

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Date: Wed, 08 May 2013 19:14:43 +0900
From: Mikiya Sato <mail@kaicho.net>
To: Meteor science and meteor observing <meteorobs@meteorobs.org>
Subject: (meteorobs) Eta Aquariids in Japan (May 6)

Dear all,

I am Mikiya Sato.
I could also watch enhanced Eta Aquarids, yesterday. Many bright meteors of ETA were observed even in Japan.
However, these two peaks might be continuous.

May 6, 2013
Time (UT)  S-long peak F     lm   ETA  Ng   ZHR(r=2.4) Obs.
                45.99  0.10  1.0  5.90  1    3    130    M. Sato
1725-1755  46.17  0.50  1.0  5.90  10   20   120        M. Sato
1800-1830  46.20  0.50  1.0  5.90  15   30   129        T. Sato
1830-1850  46.21  0.33  1.0  5.70   7   21    90        M. Sato

*Location : 138d44.8'E 35d26.5'N 1200m  Yamanashi, Japan.

>From IMO web, it seems that two peaks of ETA were observed. The first peak time was about 3h on May 6.
Probably, this was formed by -910 trail. Similarly, the 2nd peak about 15h was caused by -1197 trail.
However, these two peaks might be continuous.

And, the outburst lasted about 2 days or more. This may mean that distribution of dust had spread
because two or more kind of dust trails approached.
I have to examine it in more detail in the future.

Thank you very much to all observers!
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Thanks to / acknowledgments

- Felix Verbelen
- Micha Svoiski
- Pierre Terrier
- David Entwistle
- (meteorobs) mailing list
- Radio Meteor Observatories On Line
- IMO
- Astrolab IRIS, Zillebeke
- VVS