

Real-time fluxes
from video data

Hello. I'm

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I do galactic astronomy
during daytime

The dots



I do meteors during nighttime

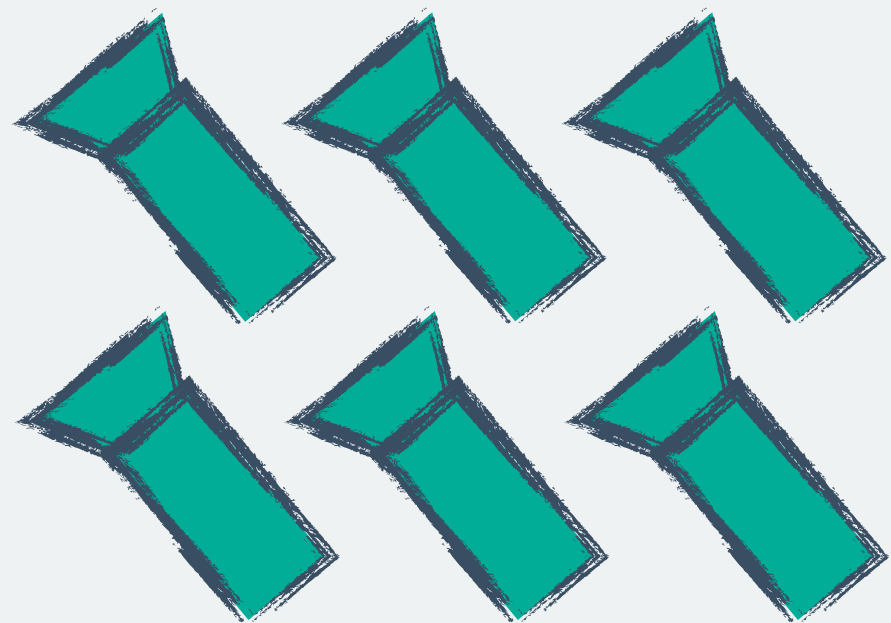


I produce the preliminary graphs

Visual observations
are *awesome*.

Because human eyes
are *sensitive*.

One human is worth
about *six cameras*.



*~1 mag deeper**
~3x larger field (100°)*
(Ignoring caveats)*

And human eyes
are everywhere.

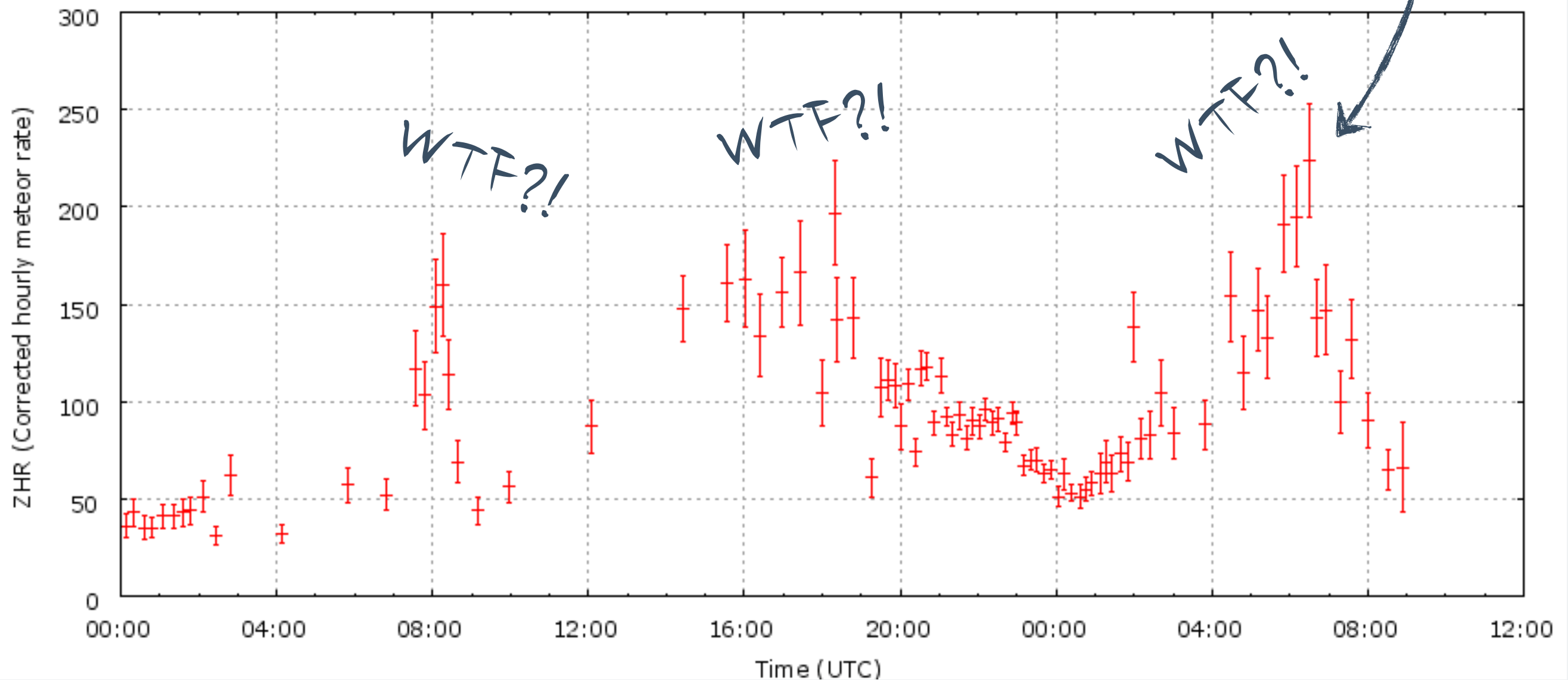
Perseids 2013 visual data



Visible light observations of
meteor rates are *useful*.

Perseids 2009

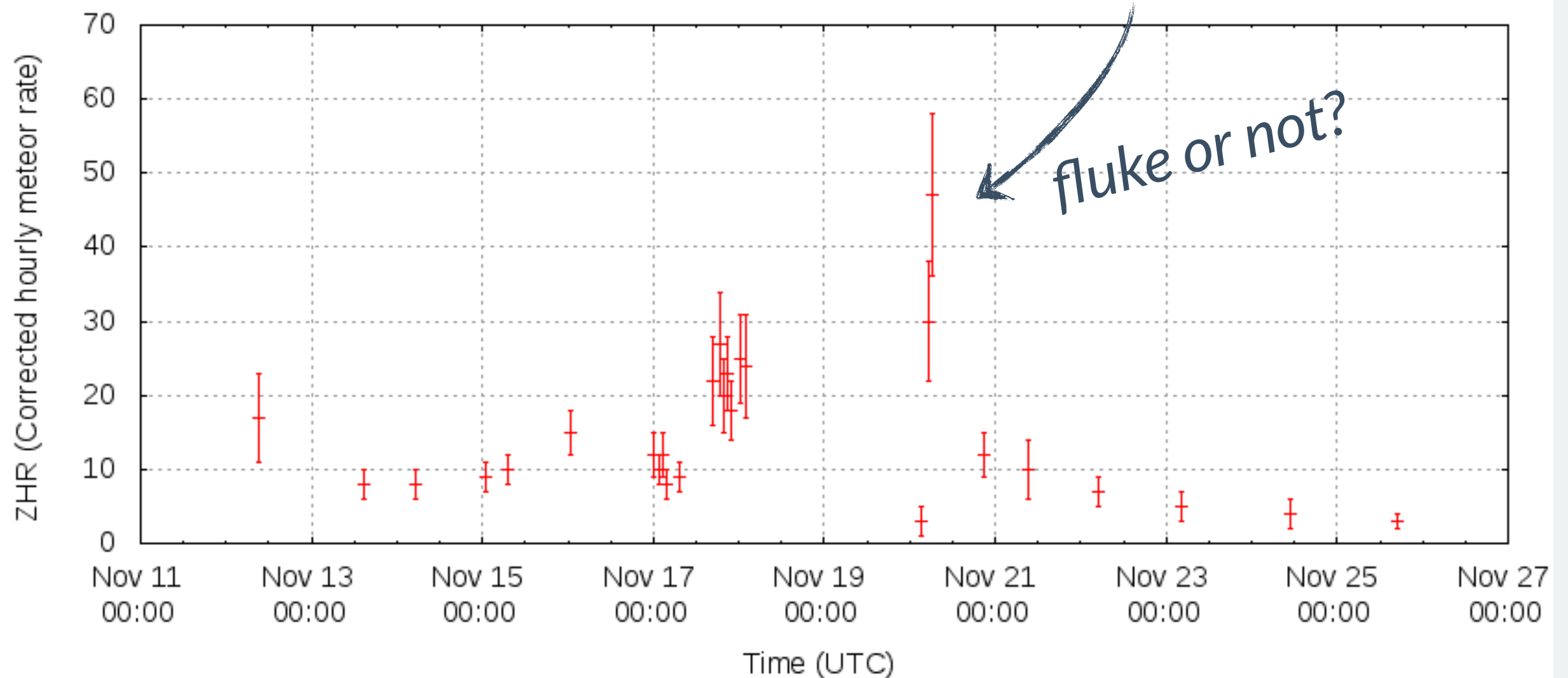
Landsat 5
got hit
(probably)



But not all showers
are *observed well*.

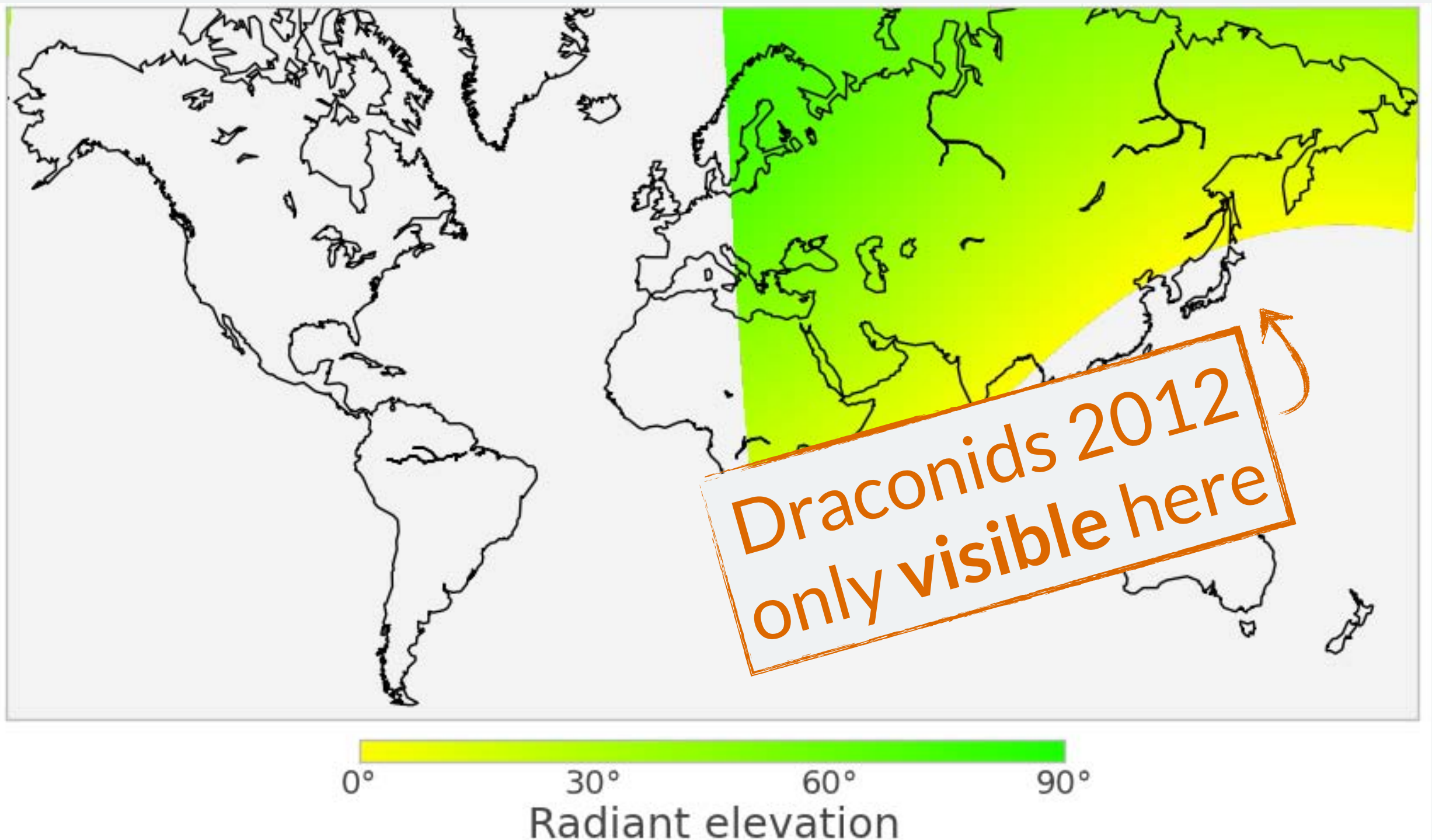
Leonids 2012

20 Nov 2012, 6 UT:
counted 33 Leonids in 1 hour



How many minor outbursts
are being *missed*?

Possibly *a lot*.



Does it *matter*?

YES.

Because outbursts
constrain *models*.

OK.

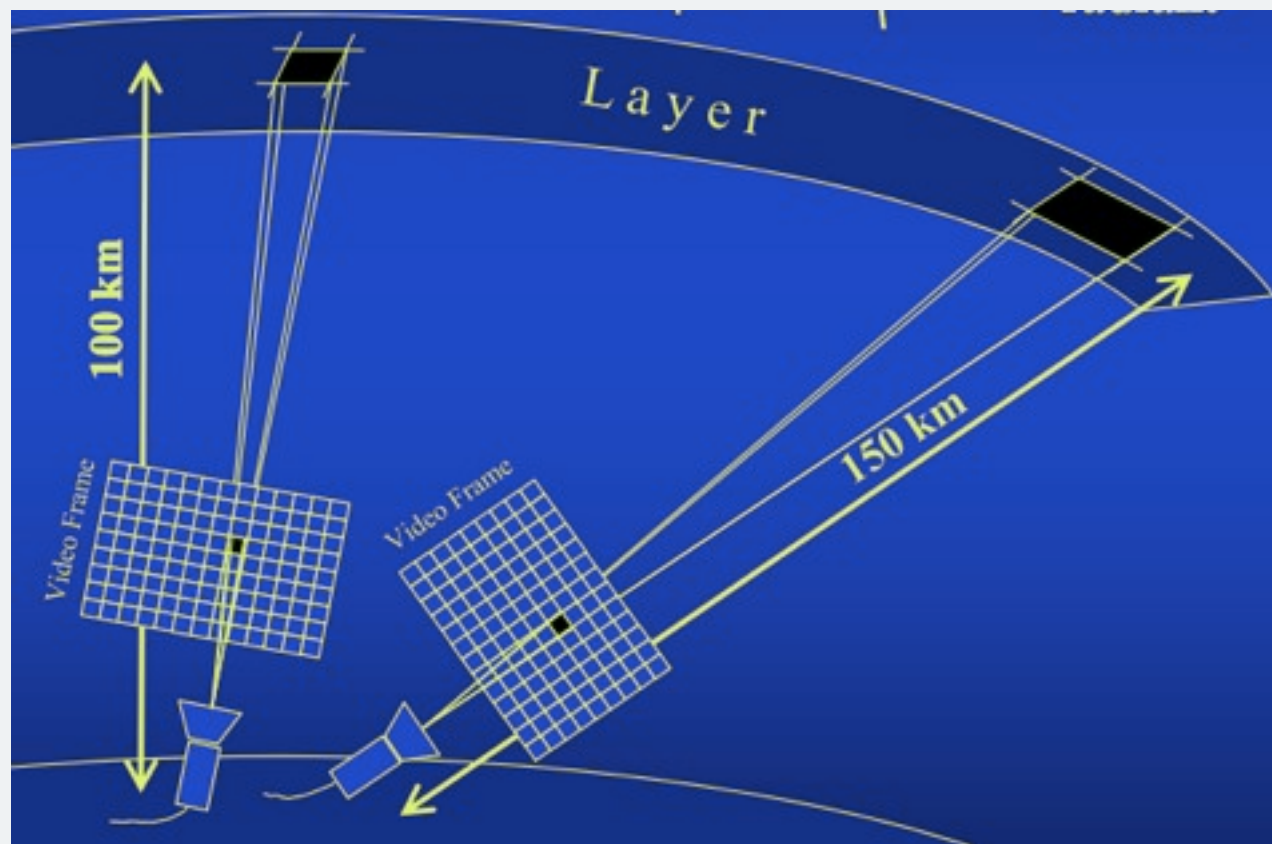
Now that we agree.
How do we **fix** this?

A full-page background image of Superman from the 1978 movie 'Superman: The Movie'. He is standing with his hands on his hips, looking directly at the camera. He is wearing his iconic blue suit with a red and yellow 'S' shield on the chest and a red cape. The background is a dense city skyline with various skyscrapers under a clear sky.

Super Sirko
to the rescue

In 2011, MetRec started
estimating fluxes.

MetRec estimates the *Effective Collection Area (ECA)*

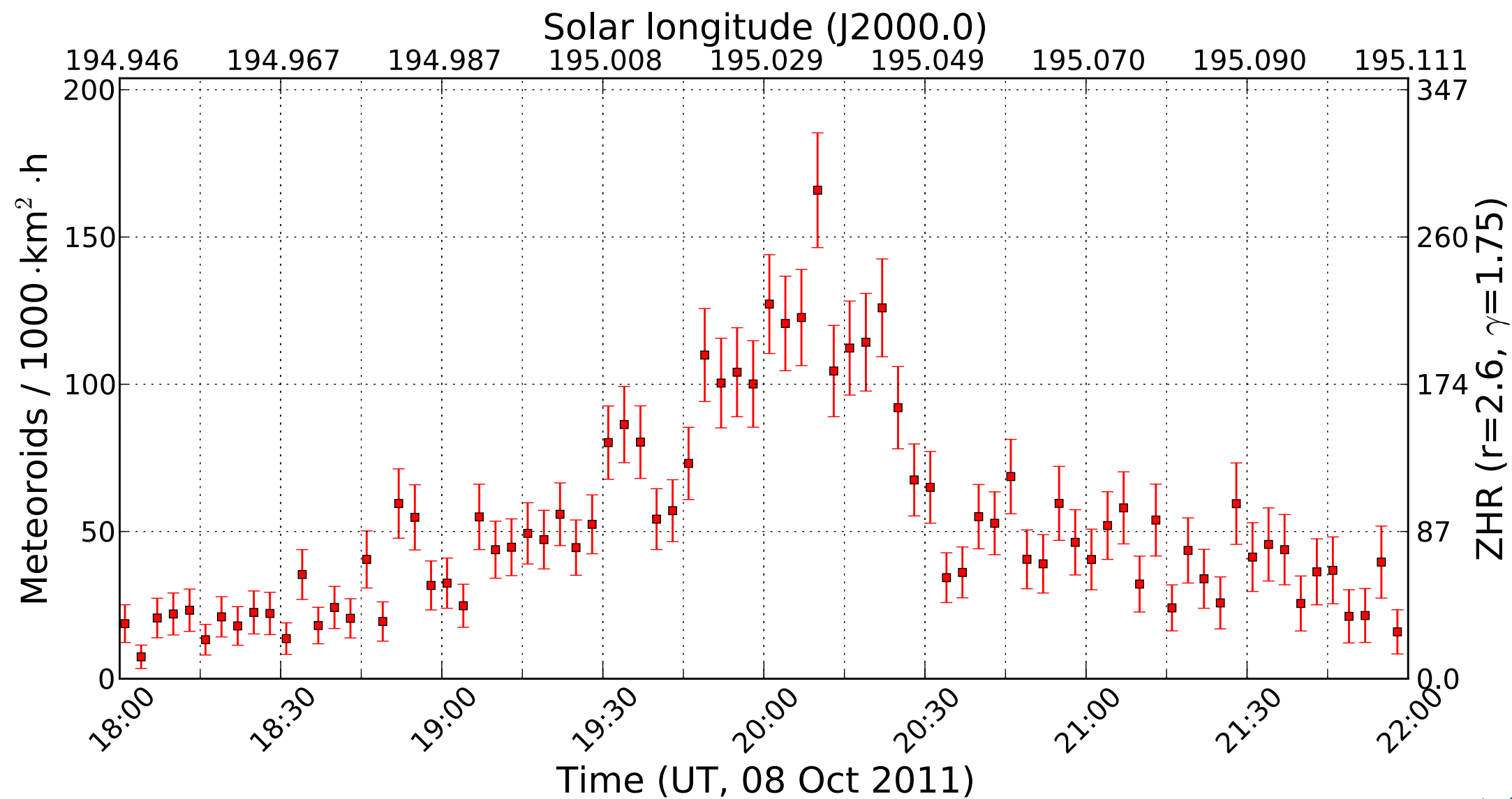


*Area corrected for
direction, extinction
and limiting magnitude.
(cf. Molau 2011)*

$$\text{flux}(\text{mag} < 6.5) = \# \text{meteors} / \text{ECA} \quad [\text{km}^{-2} \text{h}^{-1}]$$

Draconids 2011

Made available in real-time at <http://imonet.org>



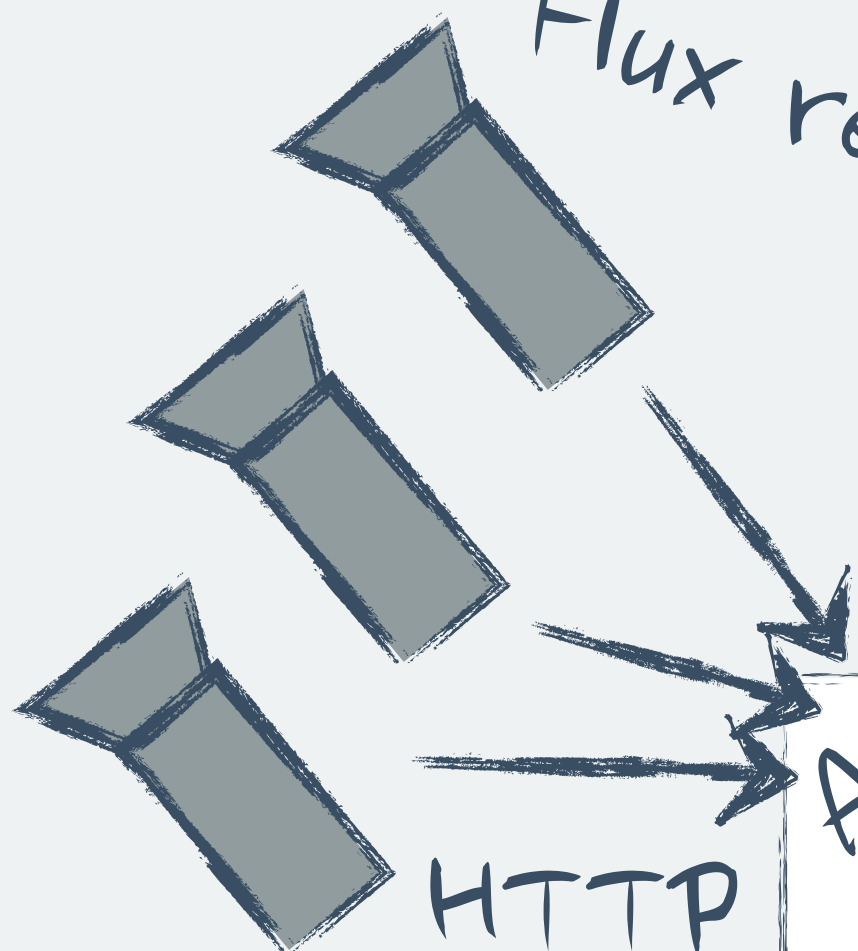
(Koschack & Rendtel 1990)

Every clear minute, MetRec produces a *flux record*.

```
{  
  'time': '2013-08-21 03:42',  
  'station': 'MINCAM1',  
  'shower': 'PER',  
  'eca': 3.18,  
  'met': 3,  
  'mag': [2, -1, 3],  
  'lm': 4.2,  
  ...  
}
```

Flux records

Flux graphs



HTTP
POST

API

 python™

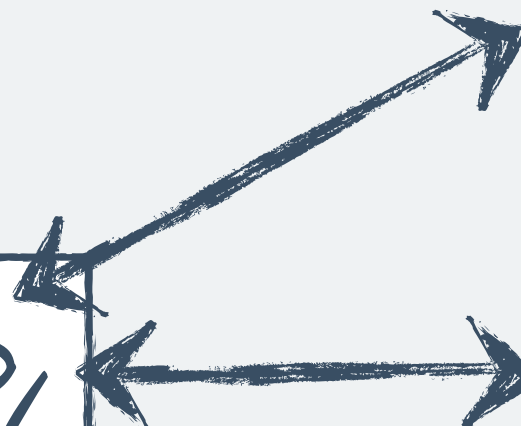
PostgreSQL



meteorflux.io

API

HTTP
GET



MeteorFlux.io

meteorflux.io

MeteorFlux.io

Use the form below to create a meteor flux profile.

Data Binning Stations Advanced

Shower: PER - Perseids (8/12)

Begin: 08/07 12:00

End: 08/17 12:00

Year: 2013 2012 2011

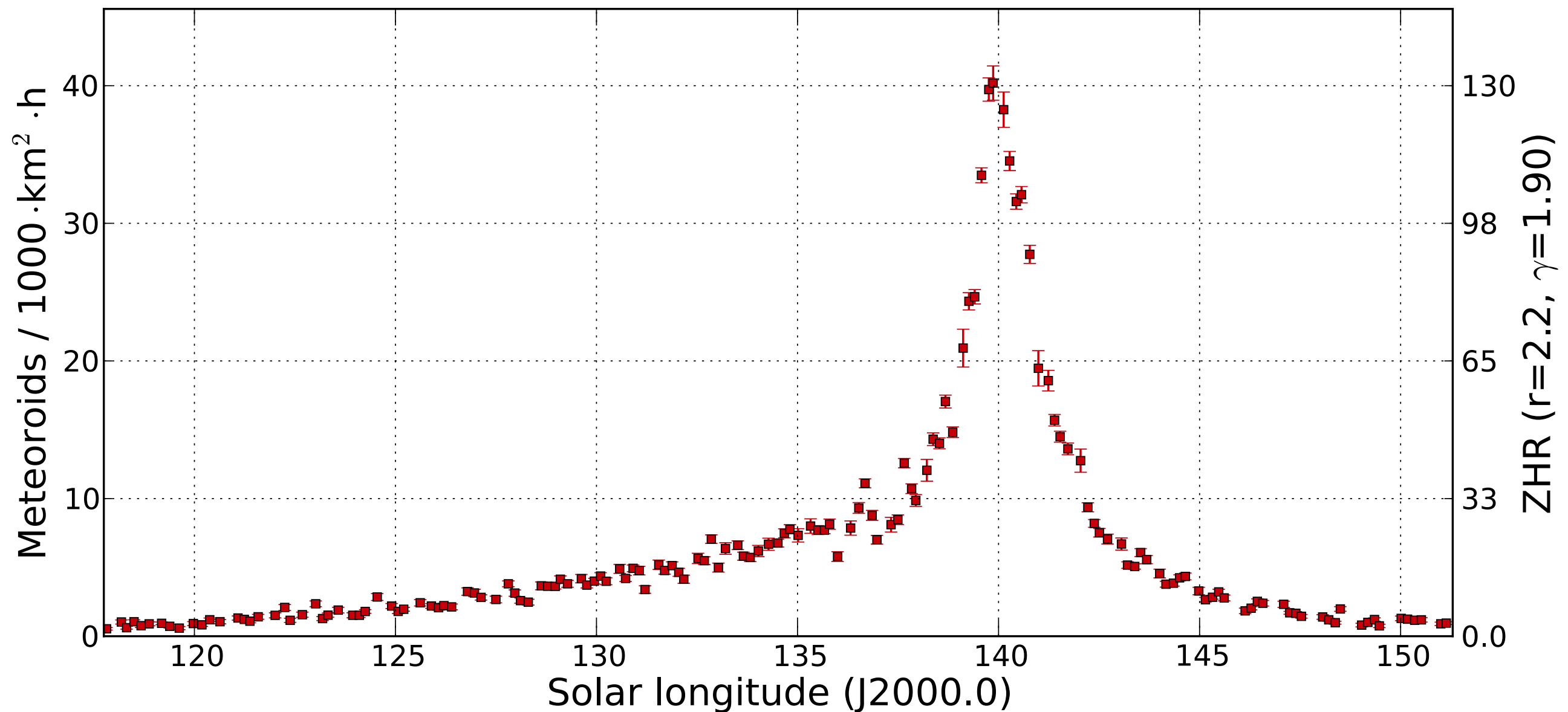
☐ Average the selected years

Create graph

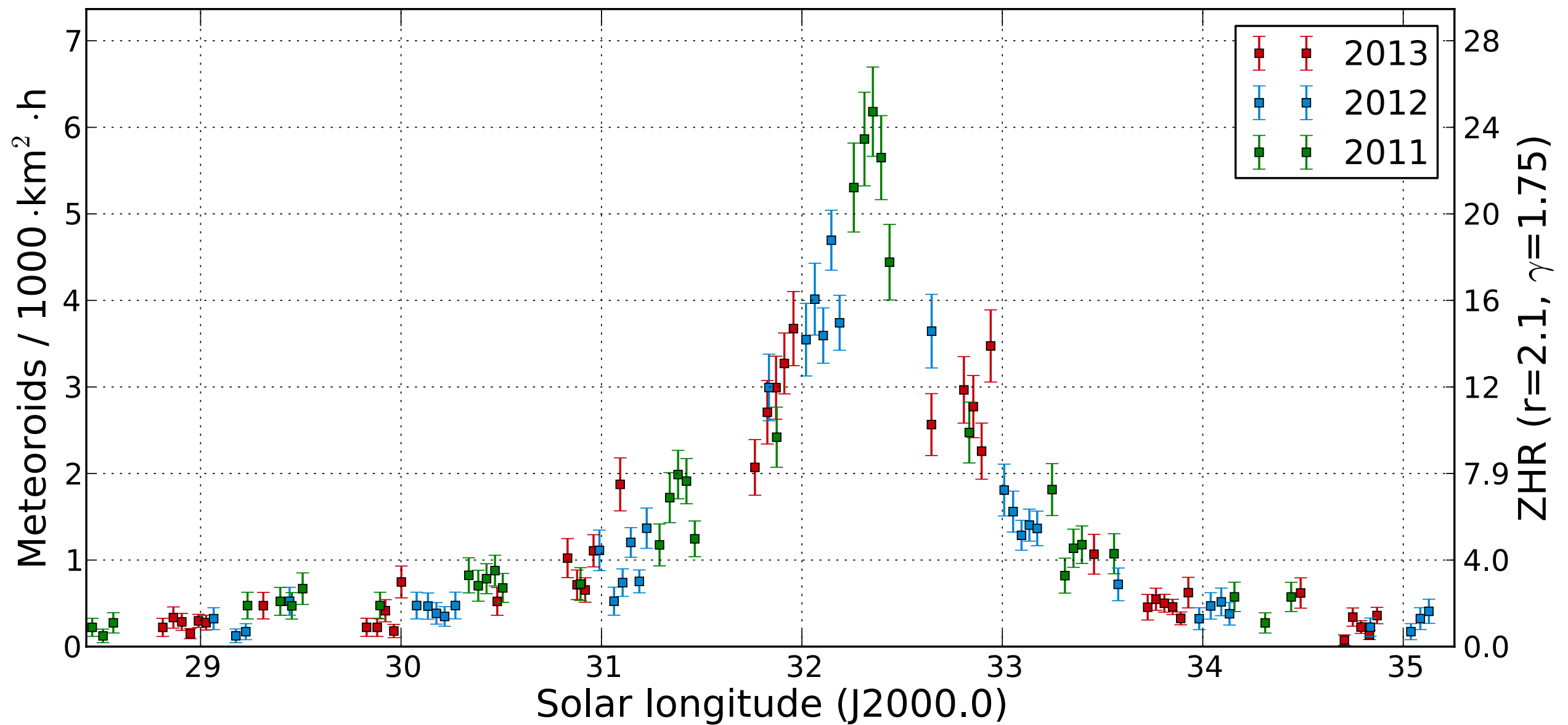
Based on data collected by observers in the [IMO Video Meteor Network](#).
Contact: Sirko Molau, Geert Barentsen.

<http://meteorflux.io>

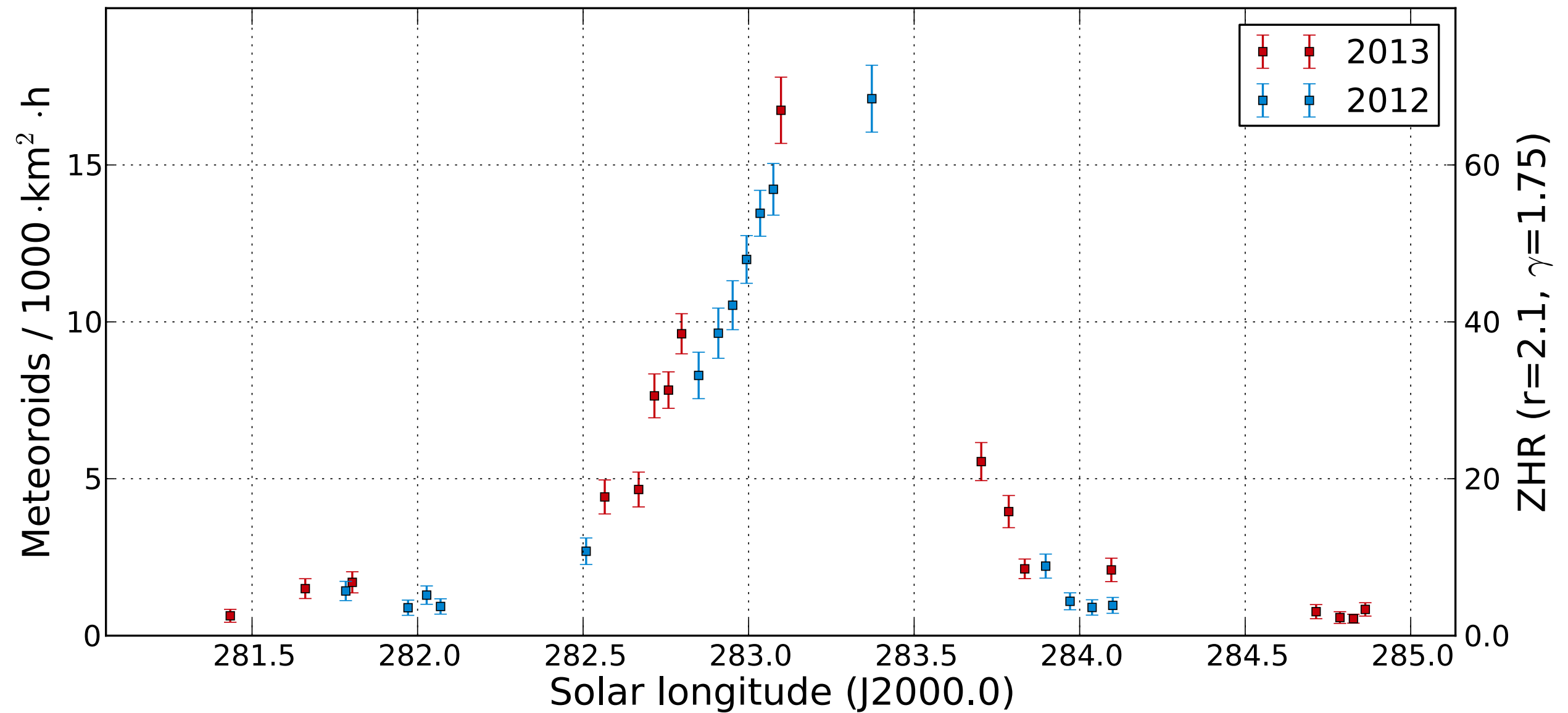
Perseids 2011-2013 (averaged)



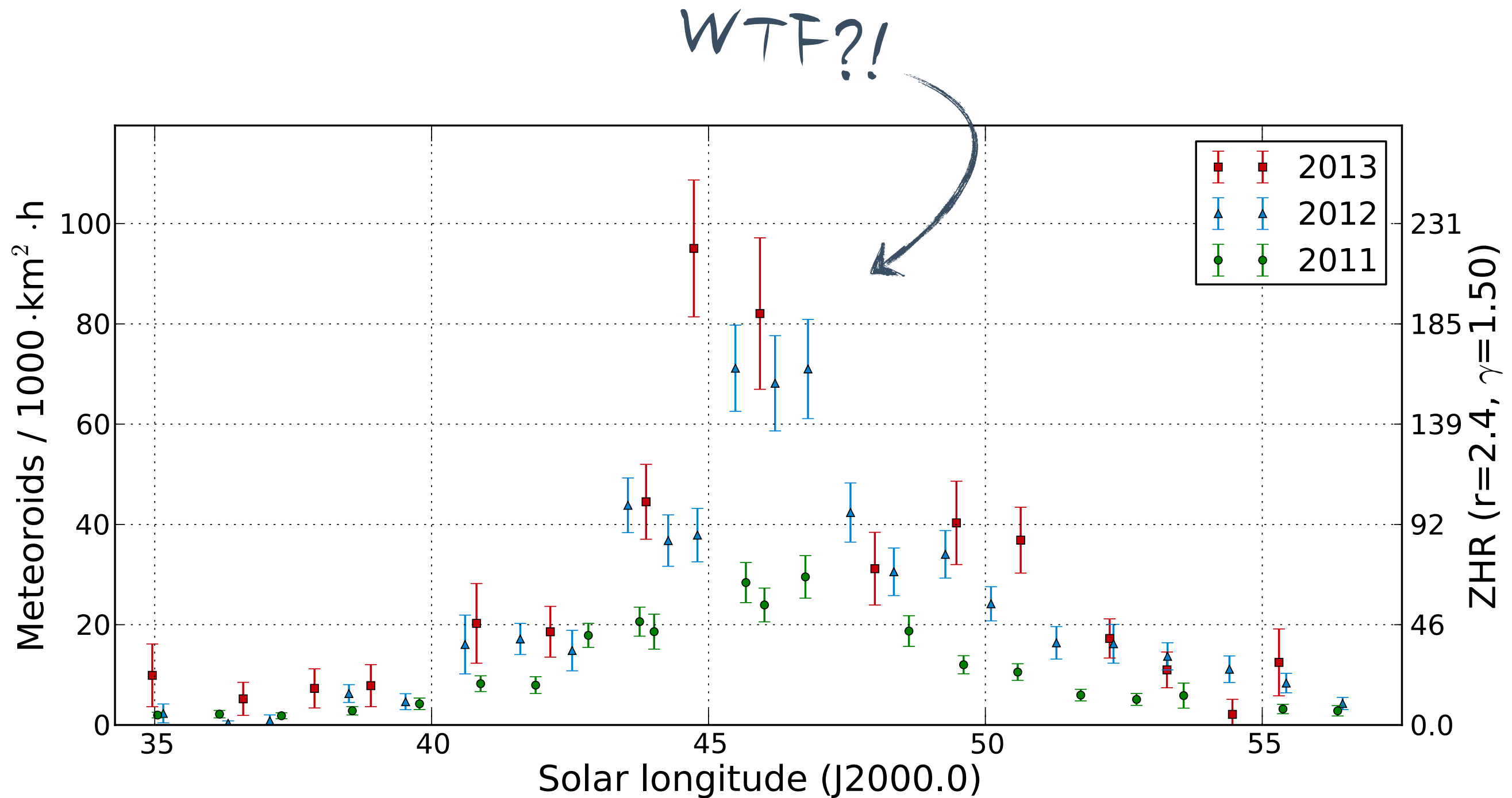
Lyrids 2011-2013



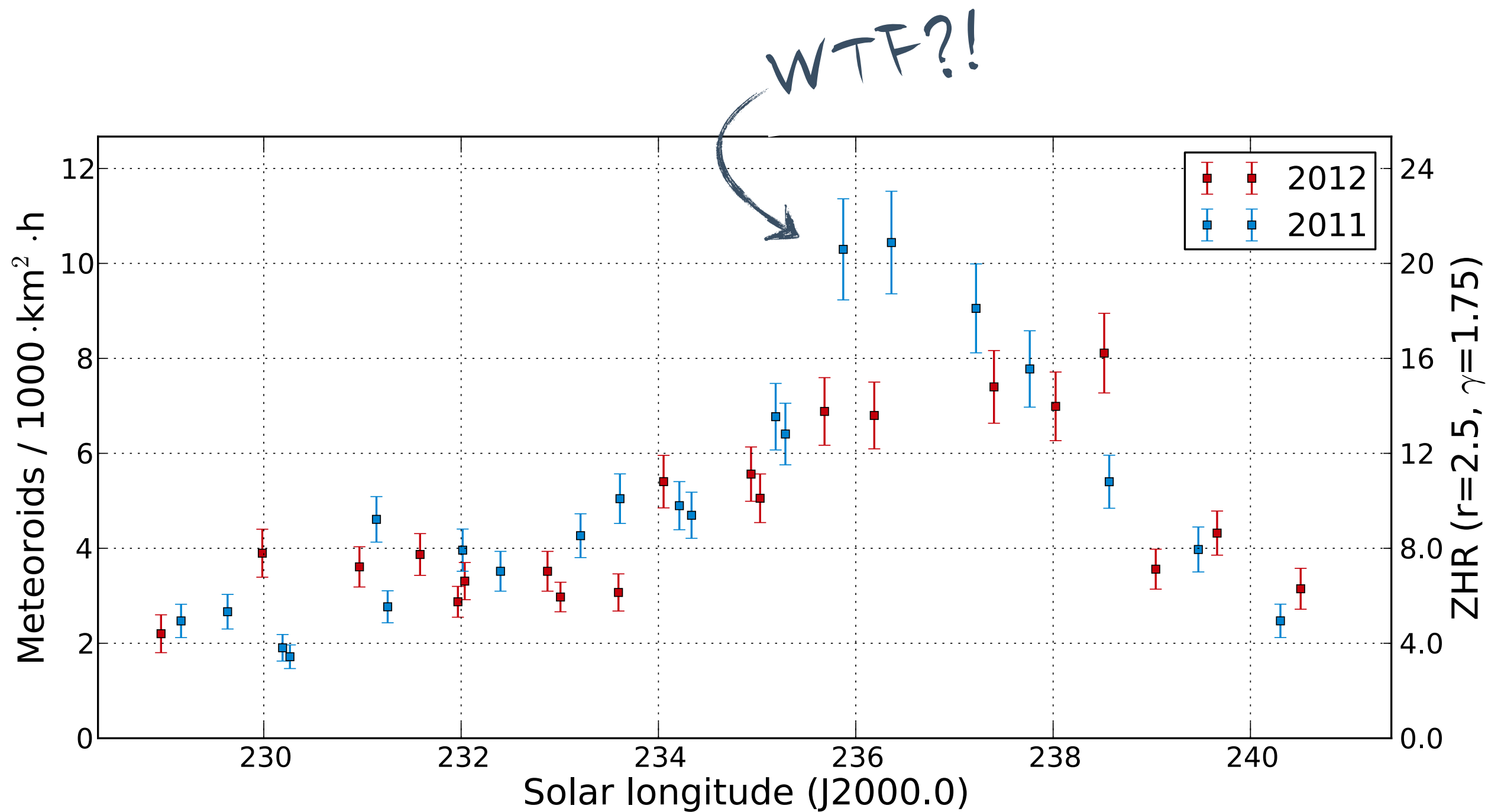
Quadrantids 2012-2013



eta-Aquariids 2011-2013

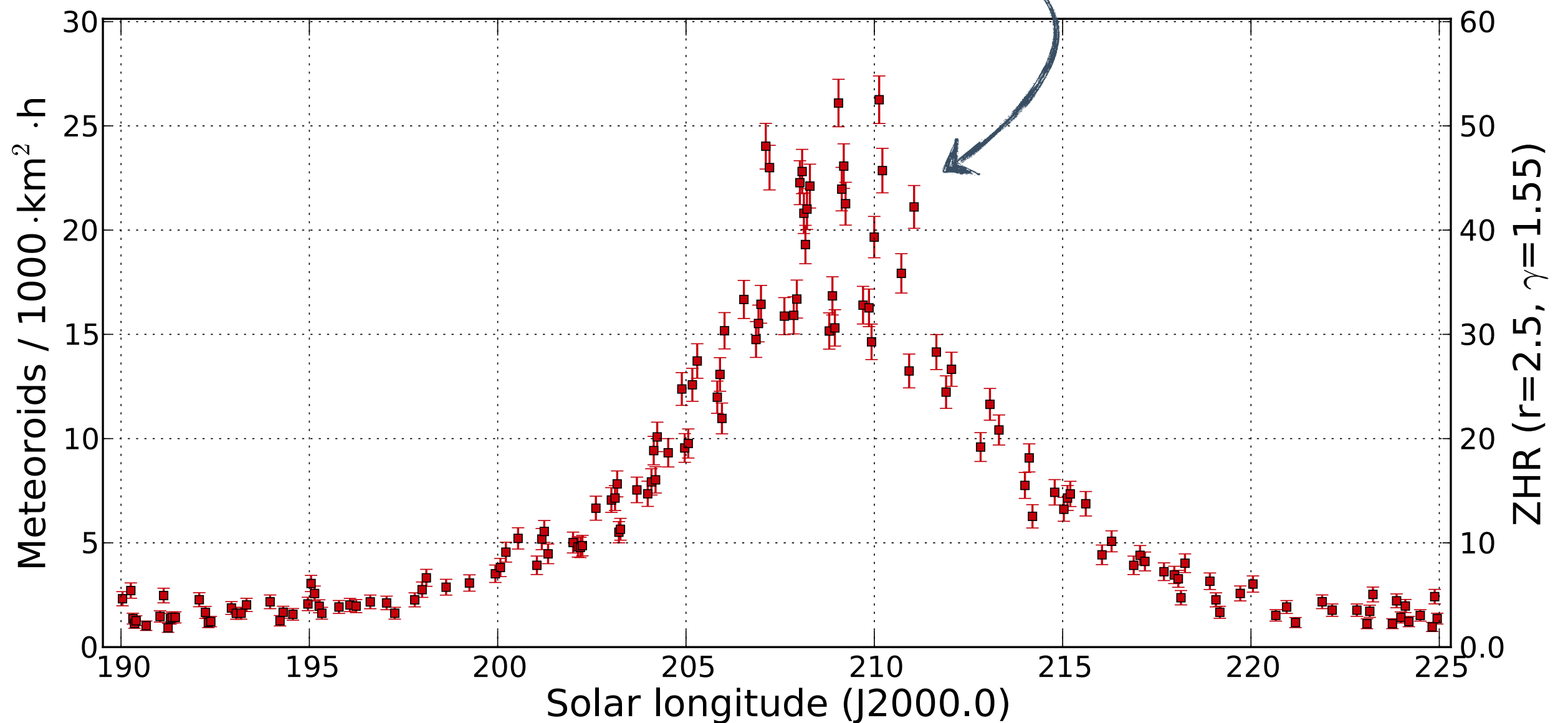


Leonids 2011-2012

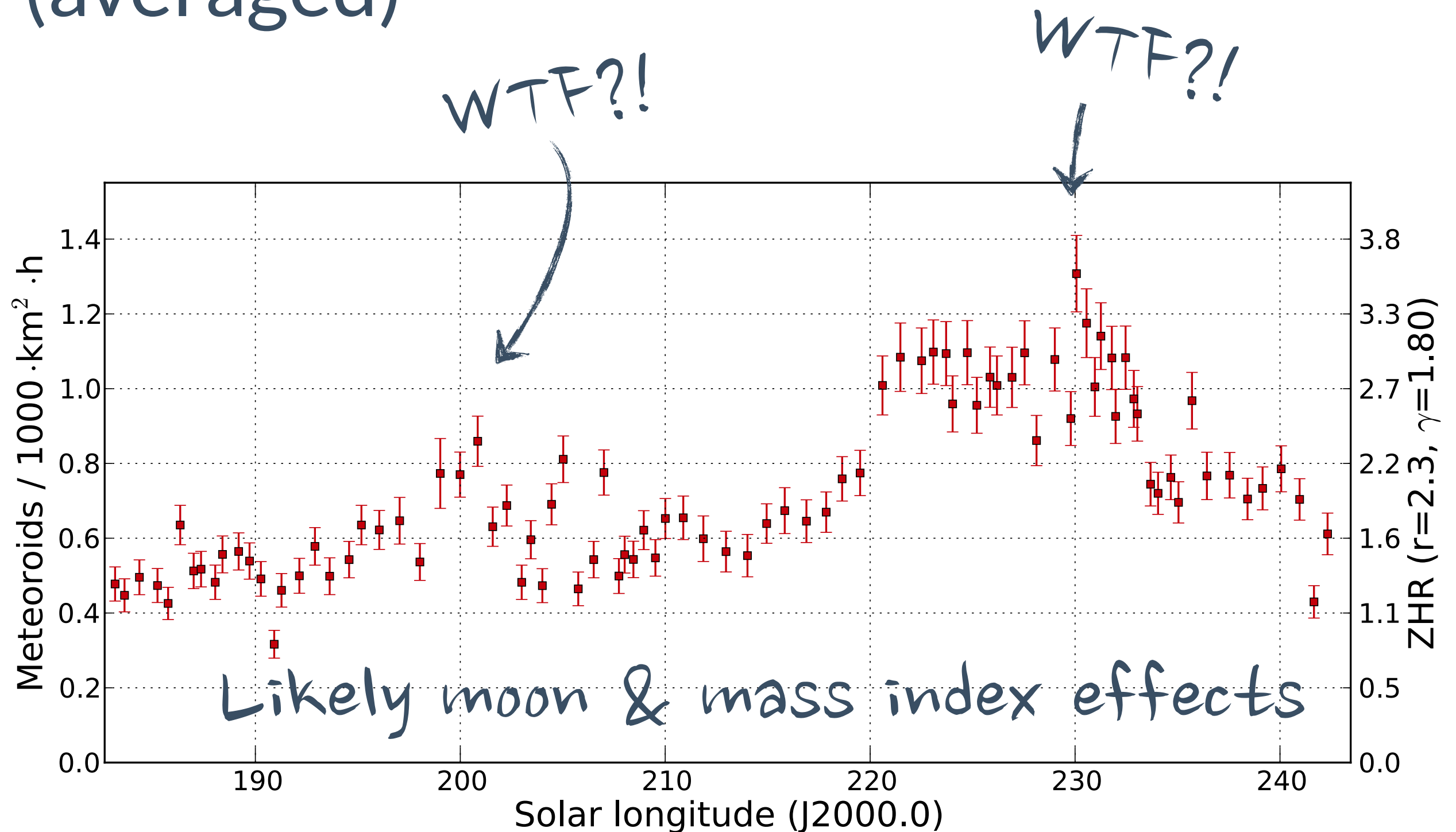


Orionids 2011-2012 (averaged)

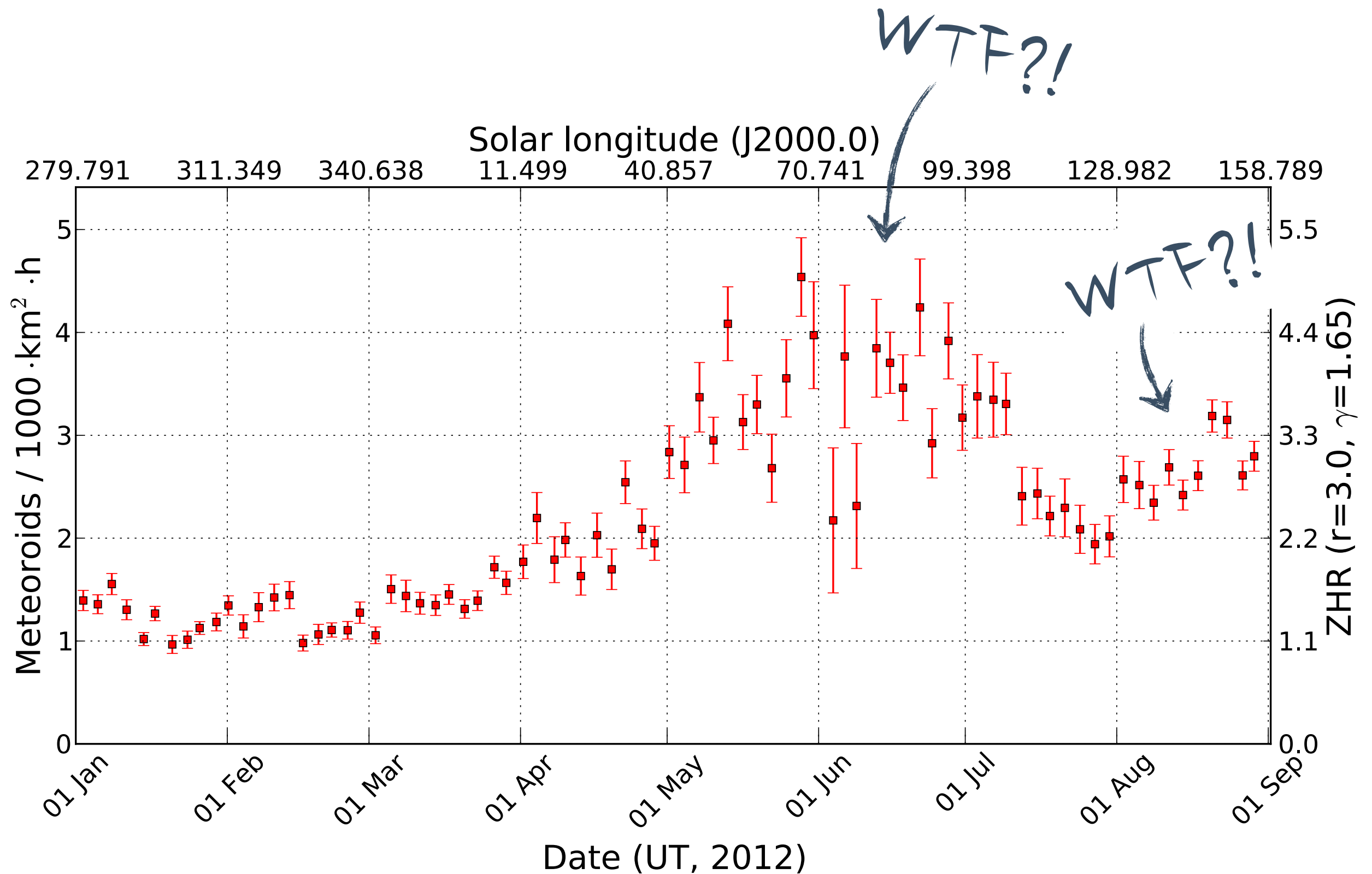
WTF?!



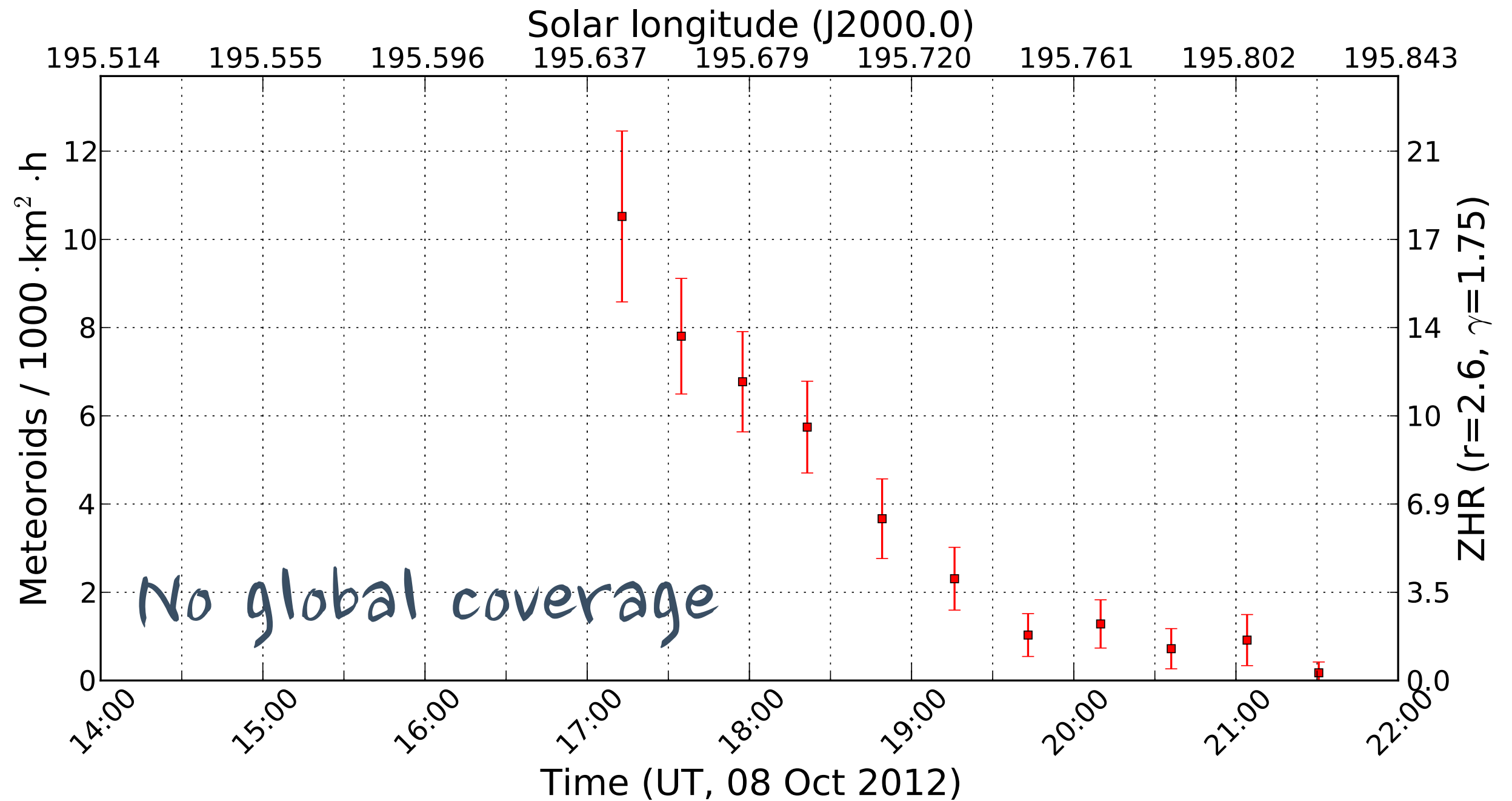
Northern Taurids 2011-2012 (averaged)



Antihelion 2012



Draconids 2012



Draconids 2012

visual observations

Alexandr Maidik (Ukraine)

55 Draconids (16h00-18h00 UT)

peak at ~16h50

Jakub Koukal (Czech Republic)

60 Draconids (17h00-19h10 UT)

peak at ~17h05

Visual observations
*are still **awesome**.*

... let's add them to the tool.

Code is **open**
under MIT license.

<https://github.com/barentsen/meteor-flux>

Anyone wants to join?

Next steps:

- ... include mass index;
- ... understand systematics (moon, clouds);
- ... switch on real-time reporting in MetRec.

Thanks Poznyan.

