

Kappa-Cygnids: Search for Periodic Activity

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Outline

- Motivation:
 - Enhanced rates/flux 2014 + Koseki paper
- Kappa Cygnids: a minor shower
 - Shower data
 - Suspected periodic activity
- Checking visual data back to 1977
 - Re-analysis of original raw data
 - Results
- Conclusions

Outline

Fireball associated to a radiant designated ALY by Koseki (2015)

Shower data

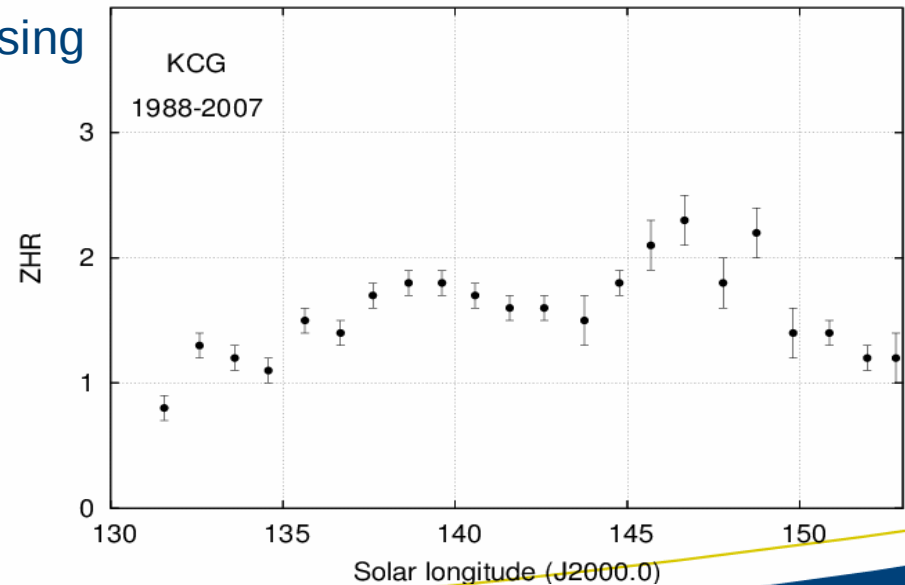
Kappa Cygnids

- observations back to 1870s (Tupman 1873), radiants in Dra/Cyg
- Radiant complex (Koseki 2015)
- Suspected periodicity of fireball occurrence
1879, 1893 (Denning 1893); 1922, 1993 (Jenniskens 2006)
- Generally enhanced rates: 2007 (Jenniskens et al., 2007) and 2014
- Suspected period of rate enhancements
7 yrs (Koseki, 2014) or 7.116 yrs (Moorhead et al, subm.)
6.6 yrs also proposed
- count backwards: 2014, 2007, 2000, 1993, 1886, 1979, ...

Shower data

Data availability

- earliest visual data in VMDB: 1985
- shower meteors easily distinguishable (**low velocity, separate position**)
- occurs during well covered period (late Perseids)
- re-analysis of data before 1985 promising
- annual profile not possible
- **broad maximum** in 2007 and 2014, $>6^\circ$ in solar longitude
- **average ZHR** in available interval



Shower data



Meeting in Potsdam in May 2015
looking back in charts and logbooks

Shower data

Data availability

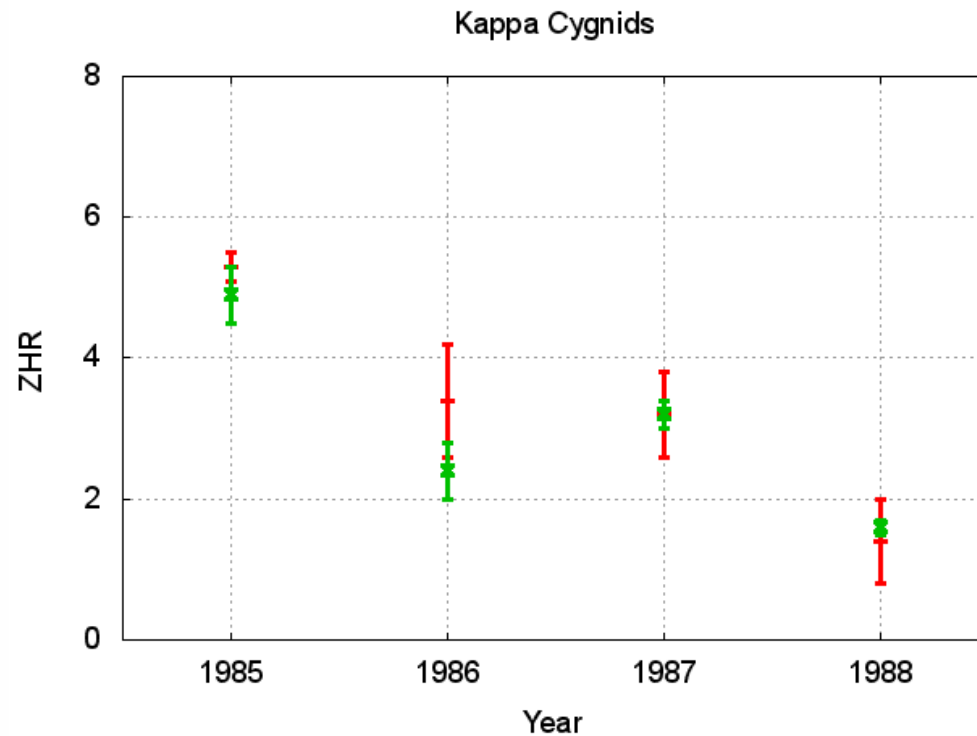
- now data **back to 1977**
- no profile for each year! – average close to 145° - 150°
- standard analysing procedures of the VMDB applied
- **fixed $r=2.5$** (if $r>2.5$, ZHRs higher)
- for some years re-analysed data **and** standard VMDB ZHRs
allows calibration and estimate of errors

Shower data

„Standard“ and re-analysed ZHR

Red: standard VMDB

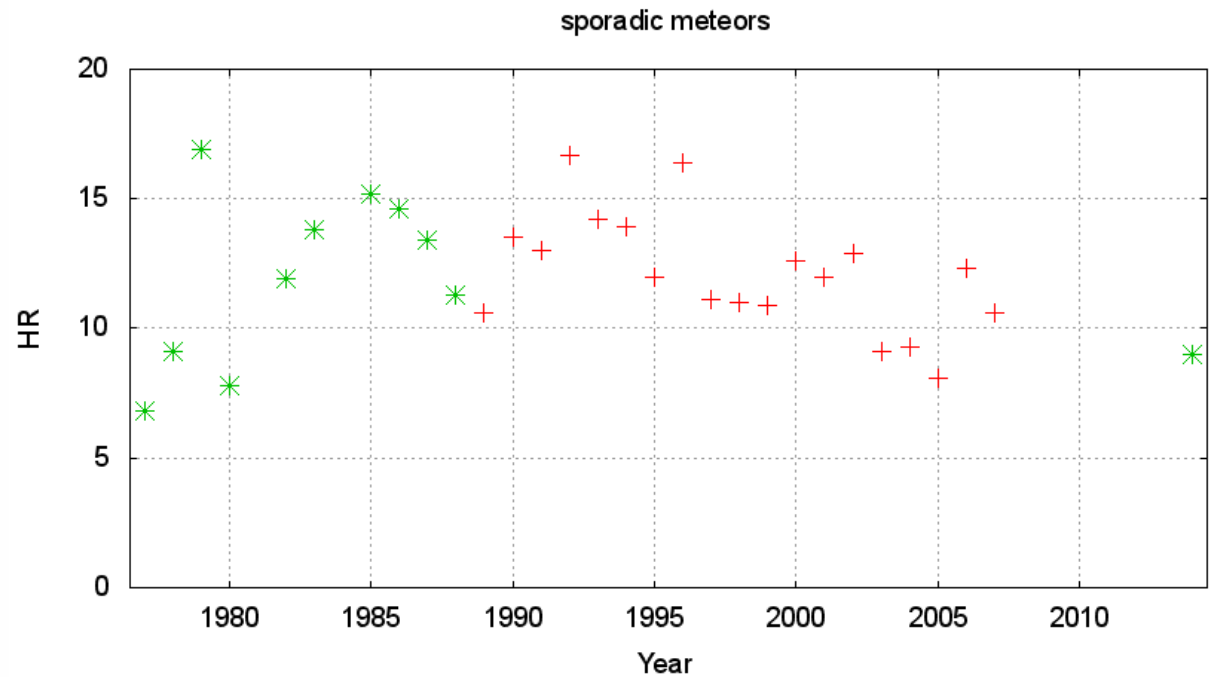
Green: re-analysed
(smaller sample!)



Shower data

Sporadic meteors

Check to avoid artefacts
and to exclude outliers



Shower data

KCG activity

- Highest ZHR:**

1978

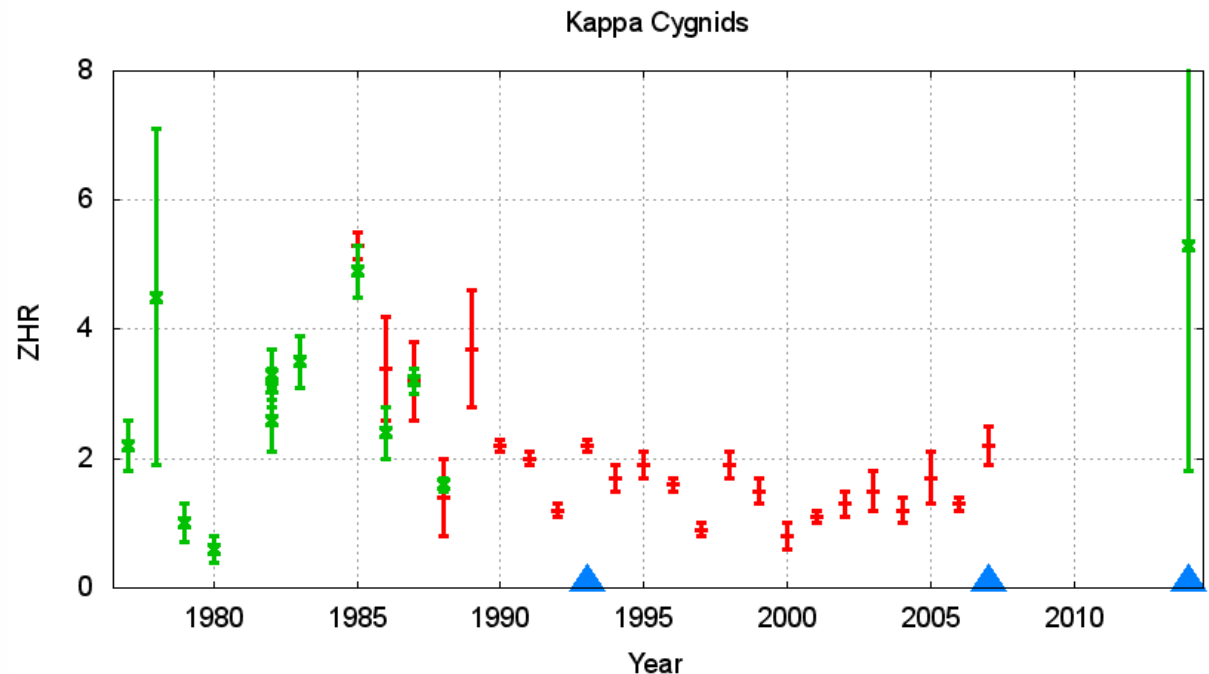
1985

1989

2014

- Triangles:**

Years of other ZHR peaks
or fireball occurrences



Summary

Years with higher ZHRs:

- 7.116 yrs and 6.6 years do not fit well
- highest ZHRs 1978, 1985, 1989, 2014

A period?

- no evident periodicity in our series
- or: more than one period?
- currently consistent data back to 1975
(has anyone earlier data?)
- stream different for bright and faint meteors?
 - radar flux: 2014 ~ 5x 2007
 - visual ZHR: 2014 ~ 3x 2007

Thanks

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