

Spurious meteoroid orbits

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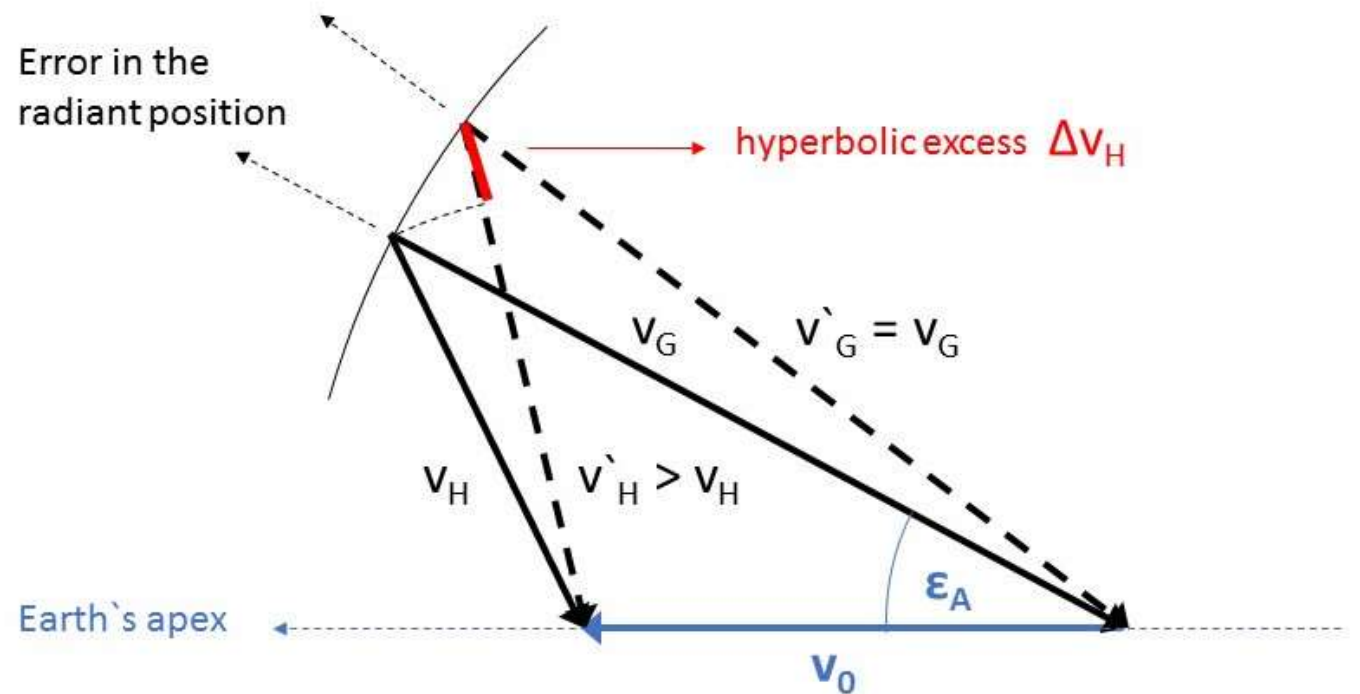
INFLUENCE OF ERRORS ON THE RESULTING METEOROID ORBIT

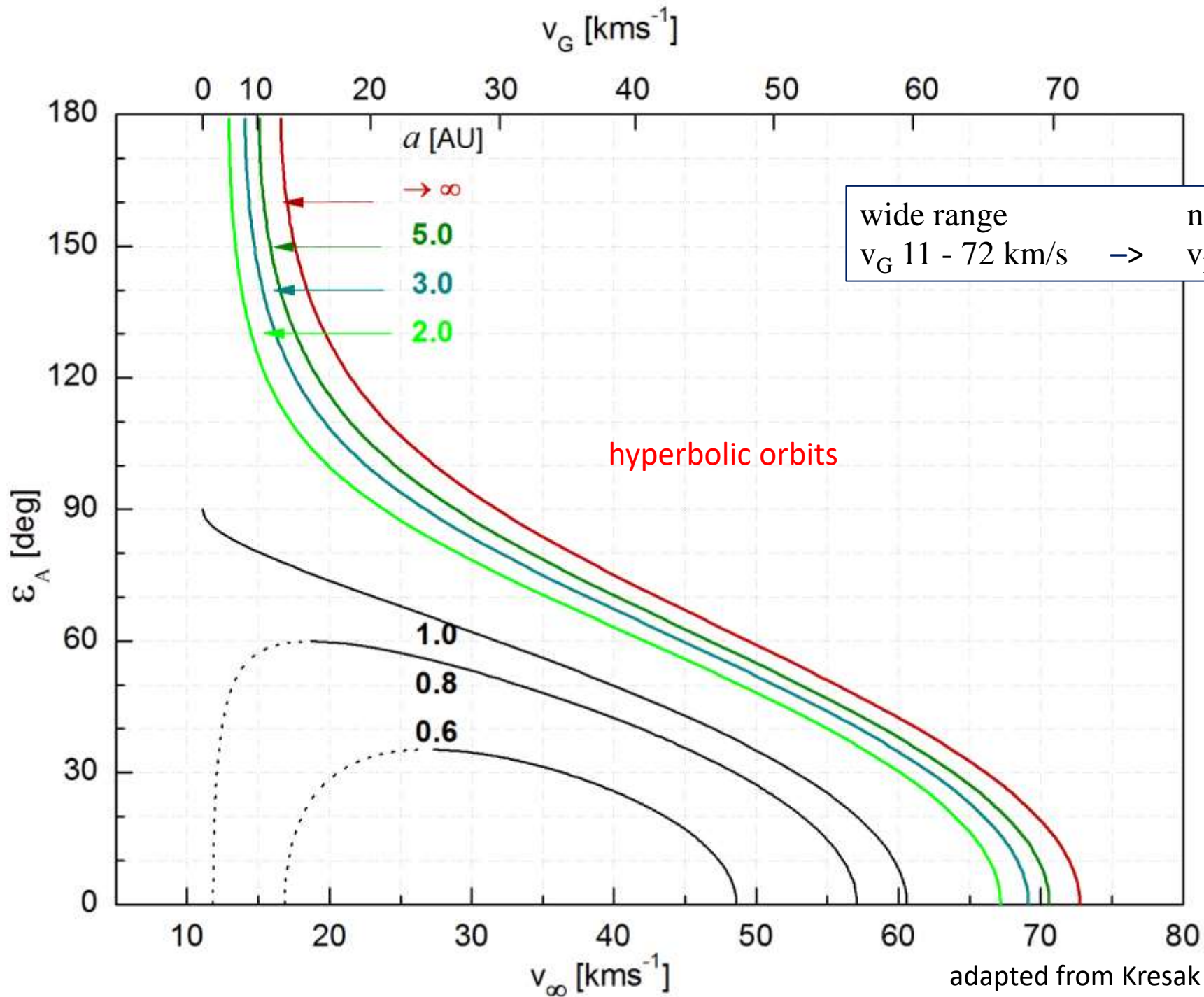
HYPERBOLIC ORBITS

$$v_H \approx v_0 (2 - 1/a)^{1/2}$$

$$v_H^2 = v_G^2 + v_0^2 - 2 v_G v_0 \cos \epsilon_A$$

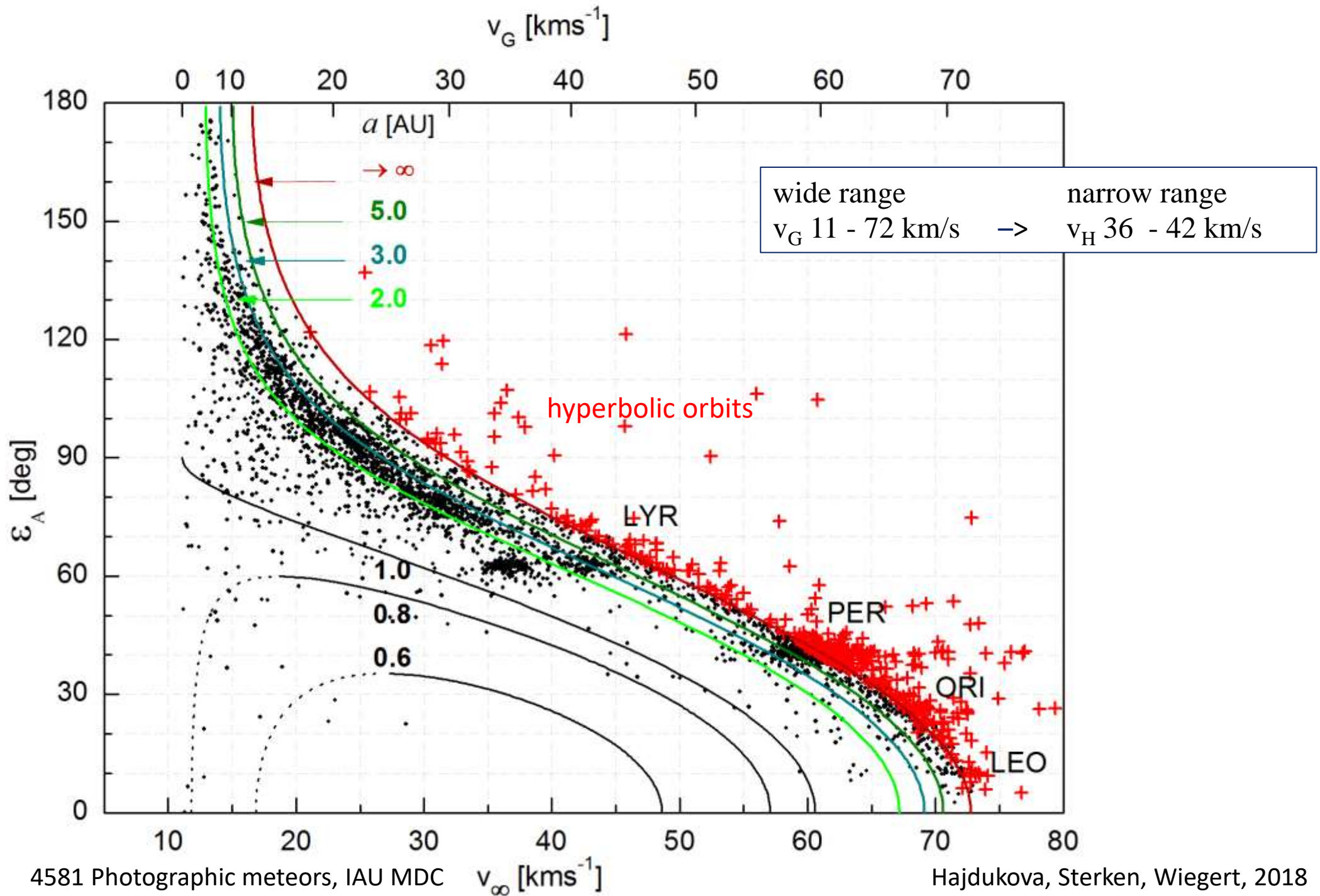
$$v_{inf}^2 = v_G^2 + 123.5$$

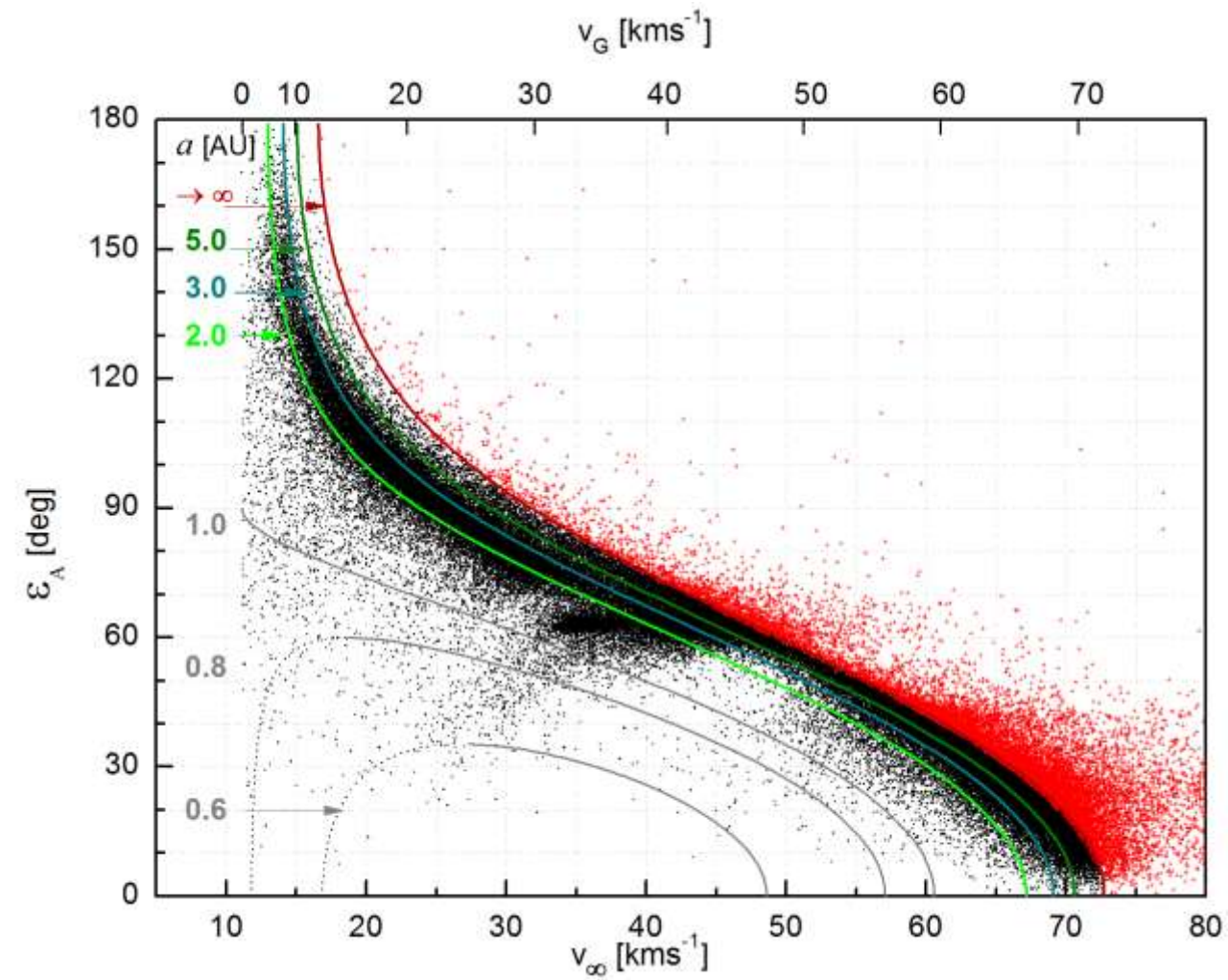




adapted from Kresak and Kresakova, 1976





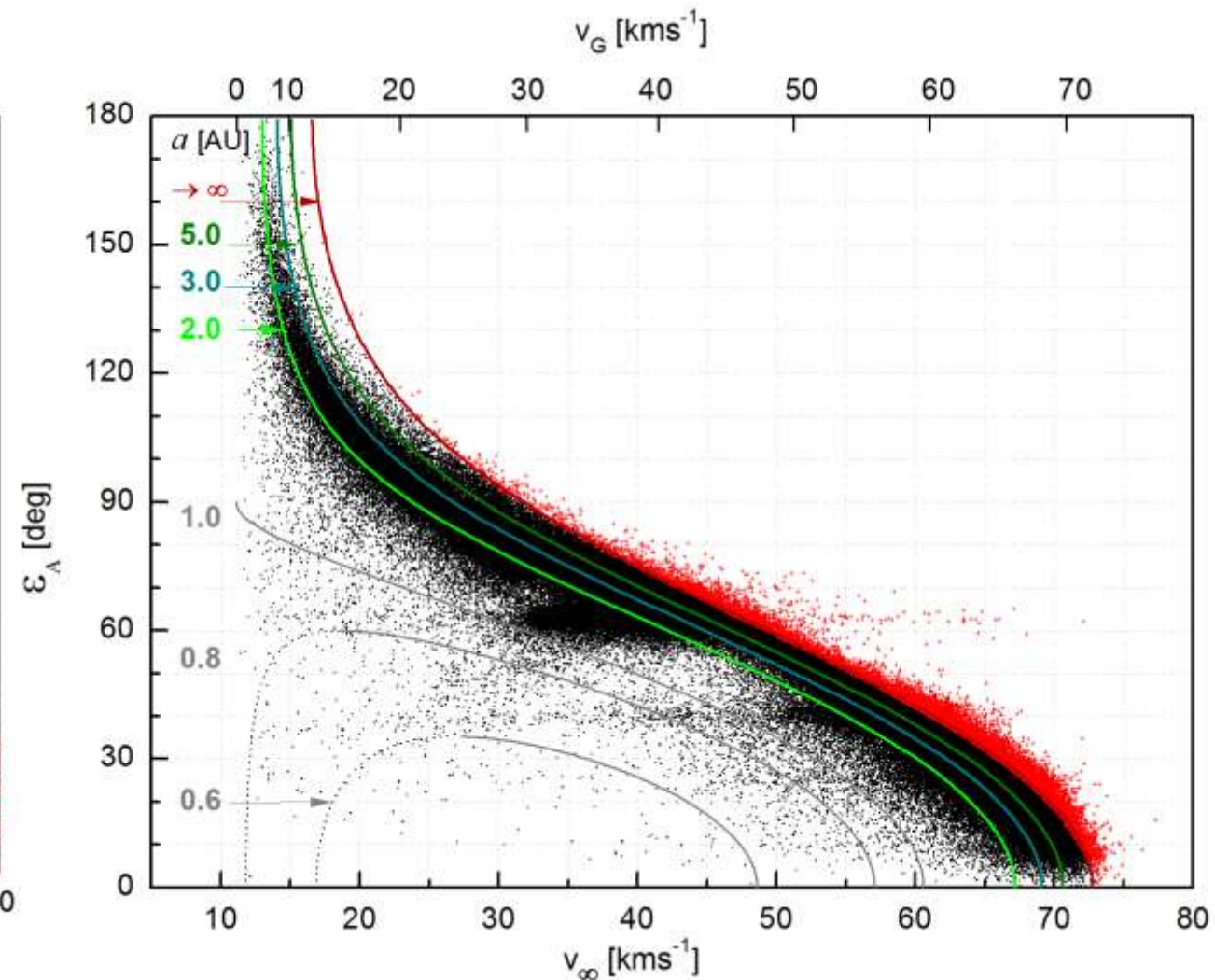


CAMS 2010-2013: 108 880 video meteors

Jenniskens et al., 2015

<http://dx.doi.org/10.1016/j.icarus.2015.09.013>

13 645 hyperbolic orbits

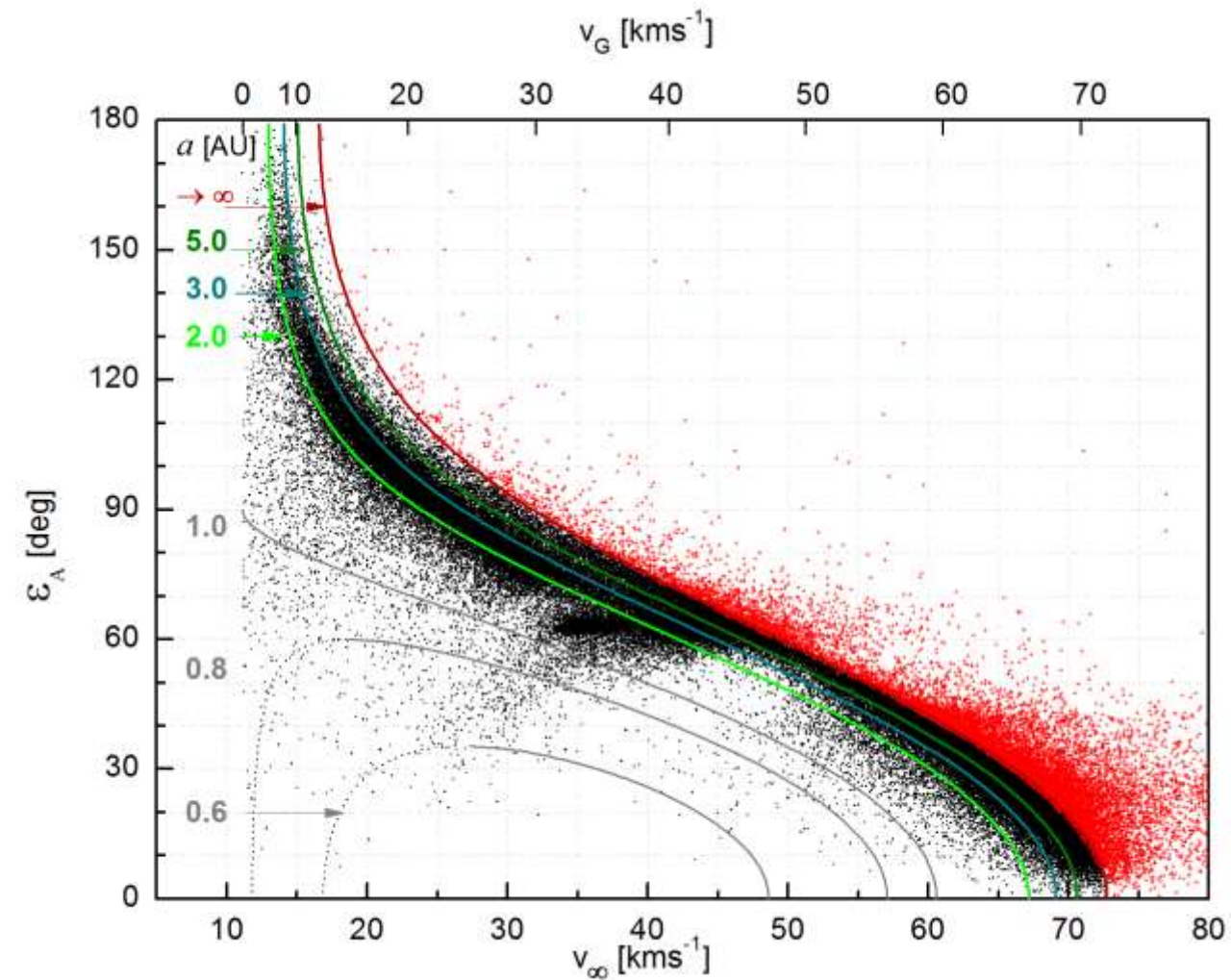


EDMOND : 251 805 video meteors

Kornoš et al., 2015

<http://daa.fmph.uniba.sk/edmond>

13 663 hyperbolic orbits

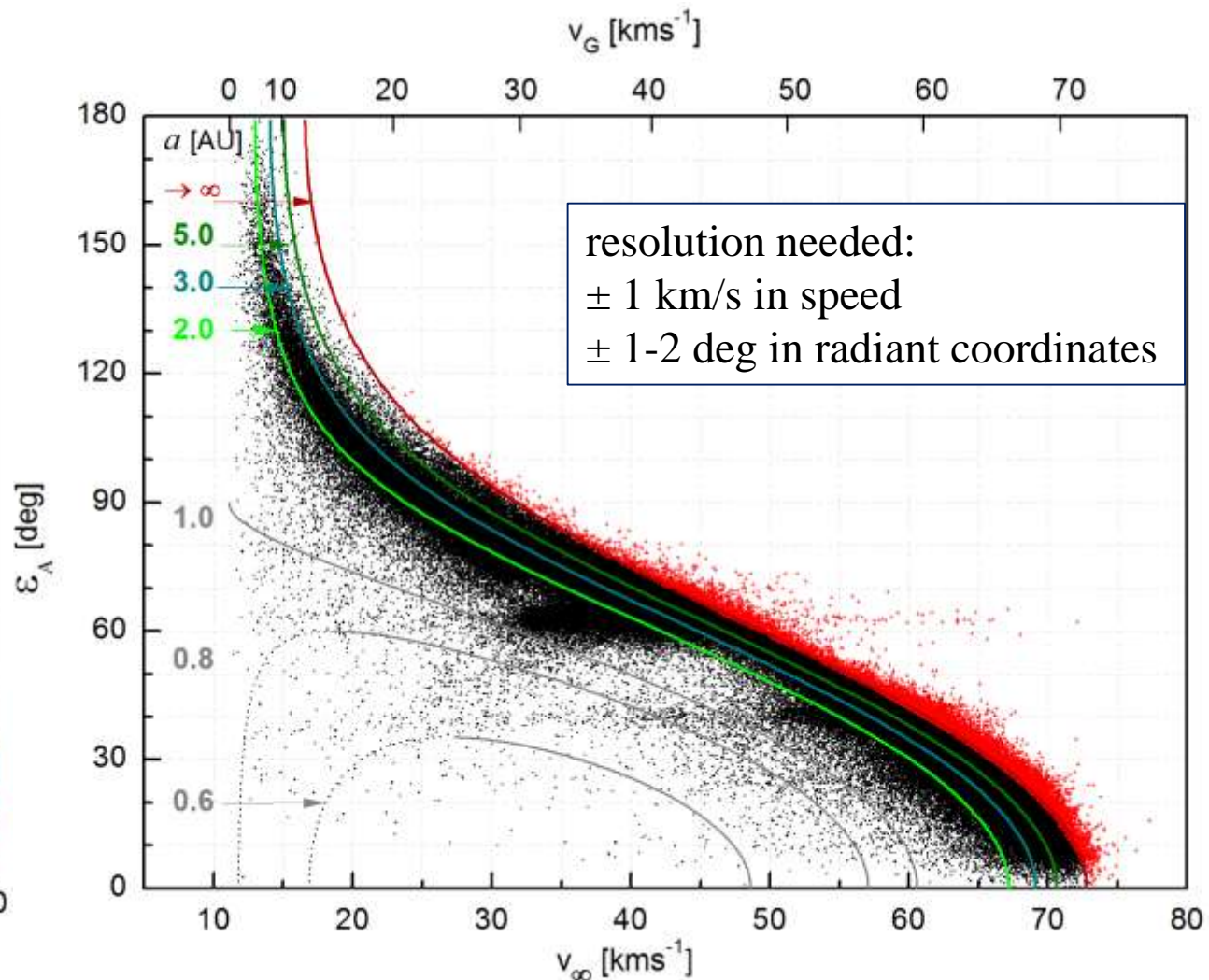


CAMS 2010-2013: 108 880 video meteors

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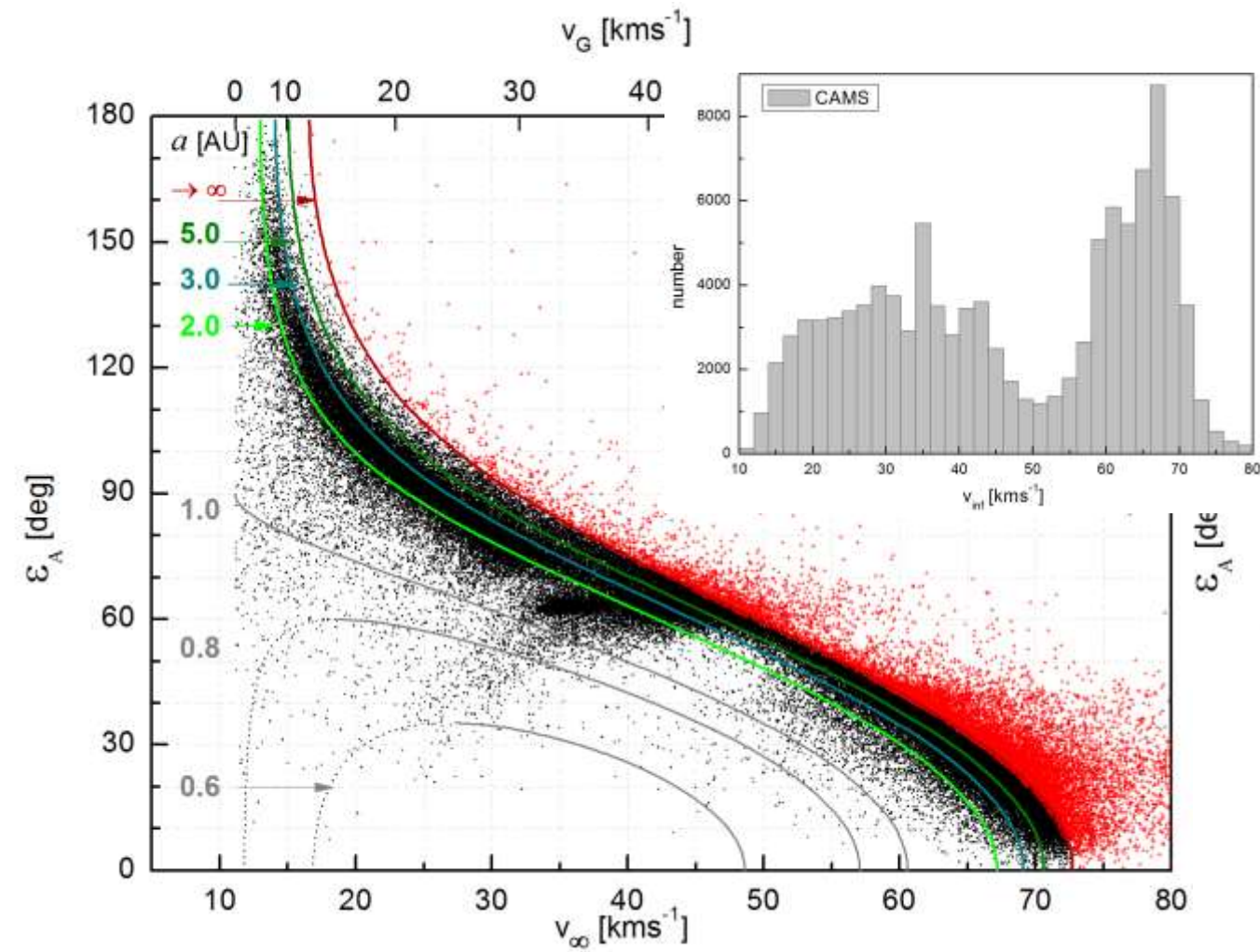


EDMOND : 251 805 video meteors

Kornoš et al., 2015

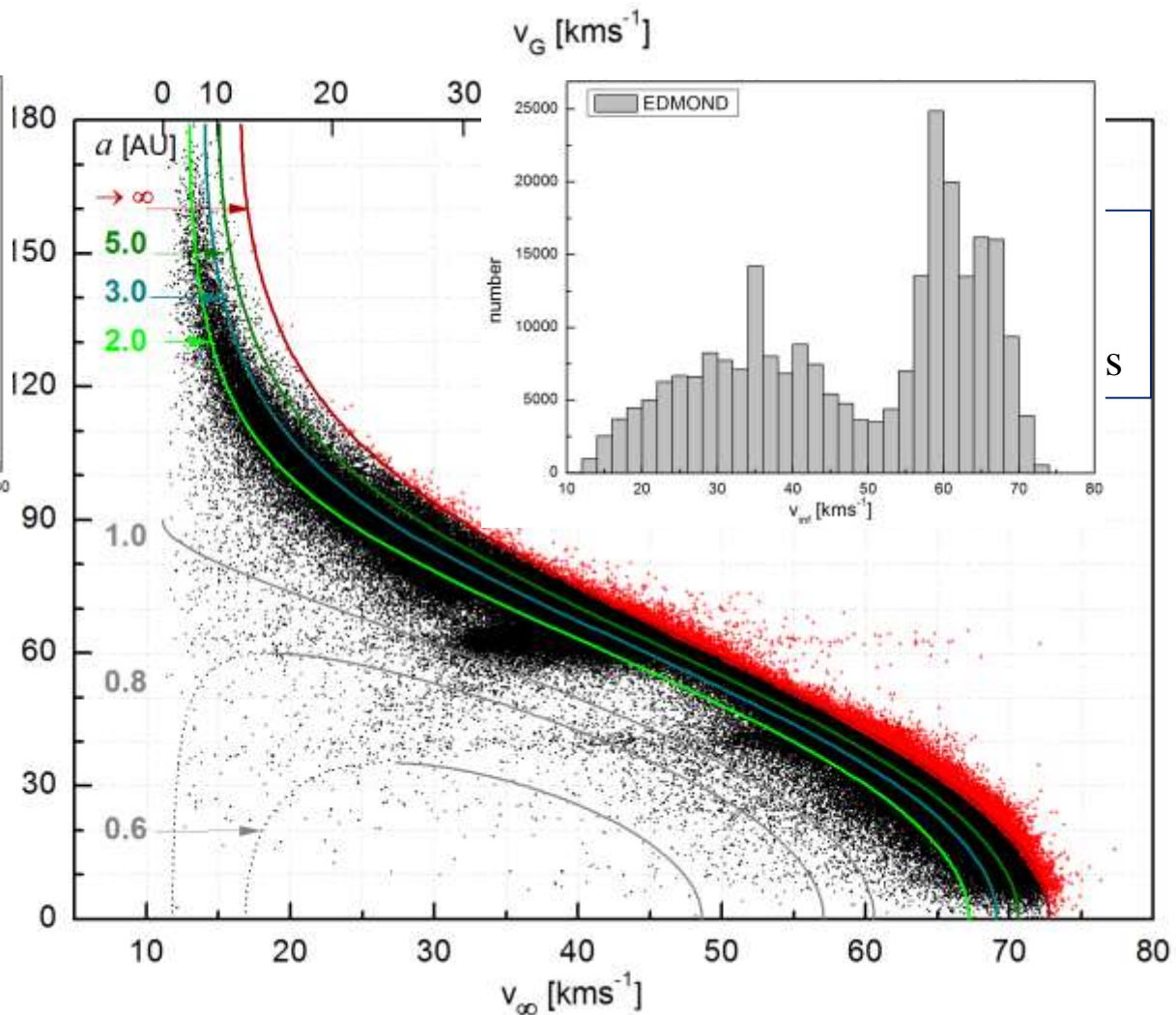
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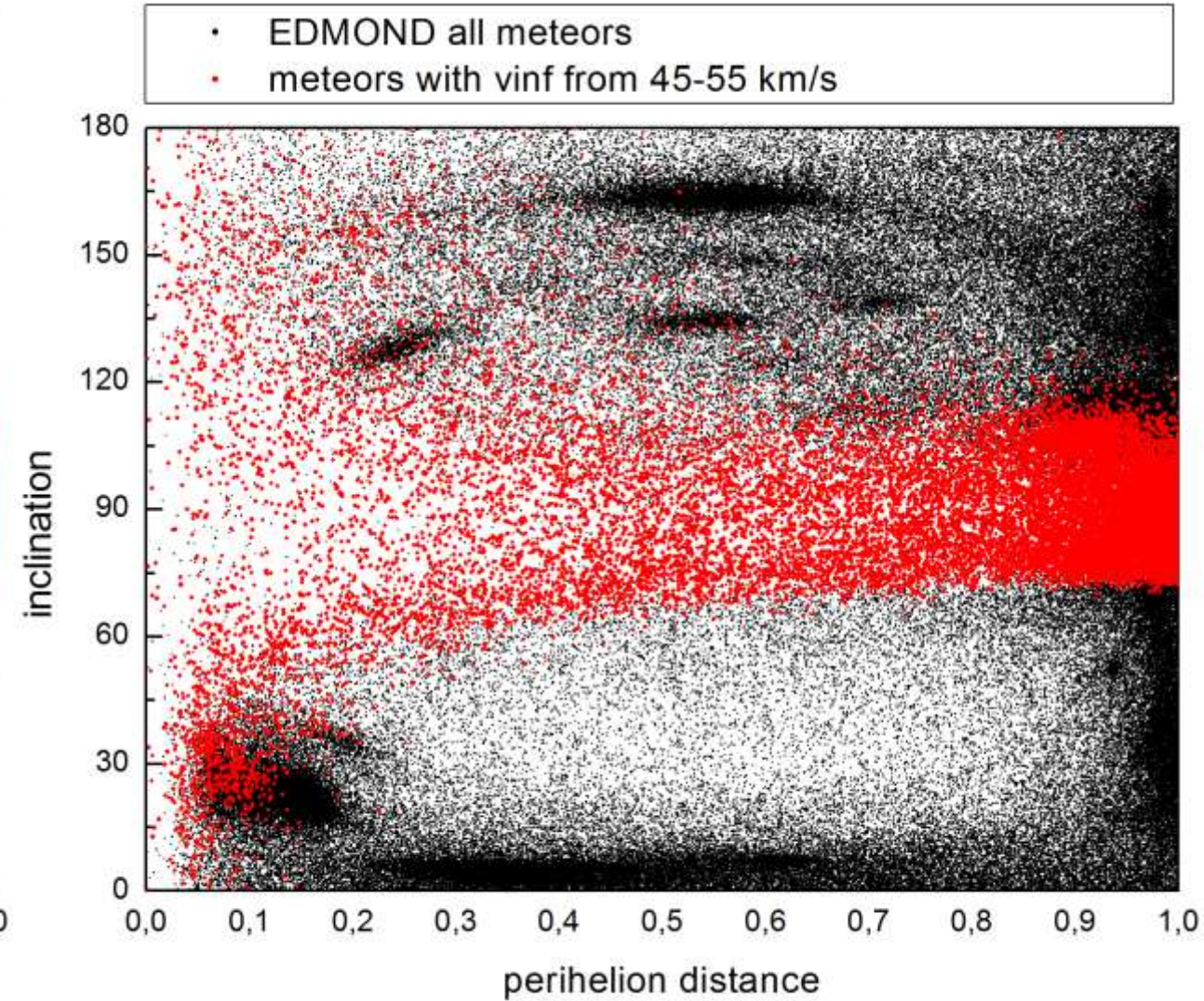
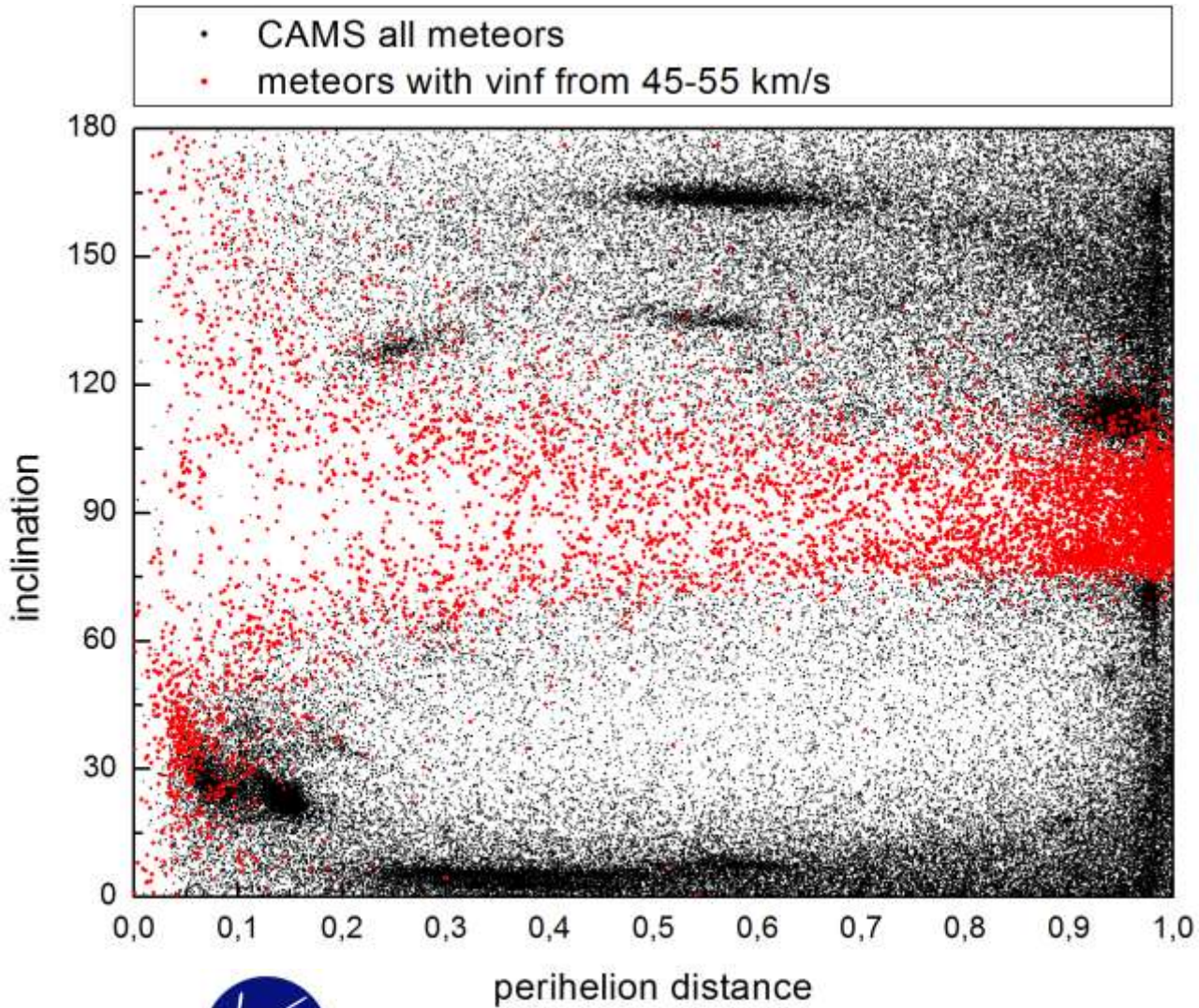


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13 663 hyperbolic orbits



BIMODAL VELOCITY DISTRIBUTION



- 90 deg inclination
- low perihelion distance orbits

PHOTOGRAPHIC METEORS IAU MDC: 4581 orbits Lindblad et al., 2003

INCLINATION

Elliptical orbits:

0 deg

20 deg

30 deg

Parabolic orbits:

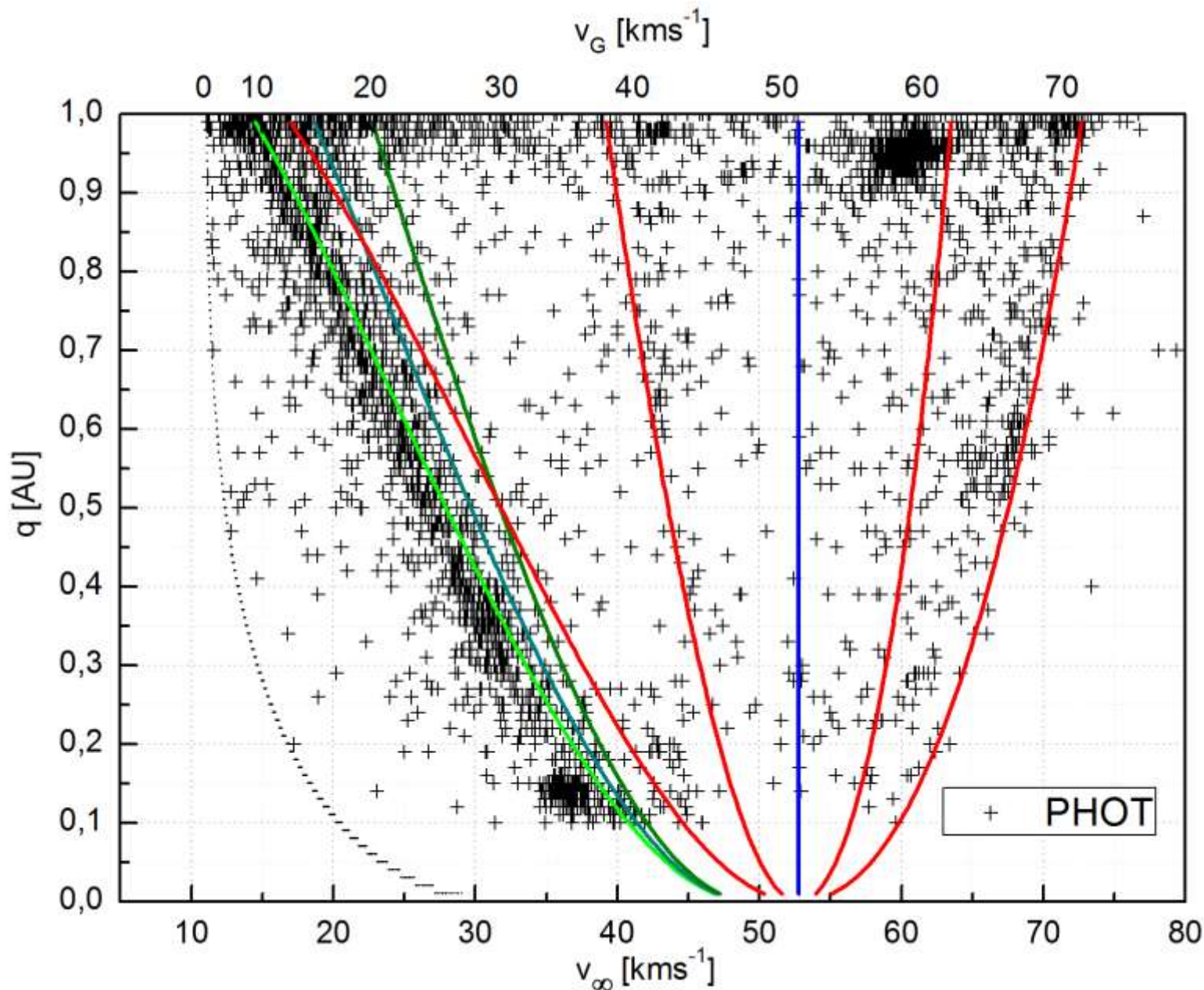
0 deg

60 deg

90 deg

120 deg

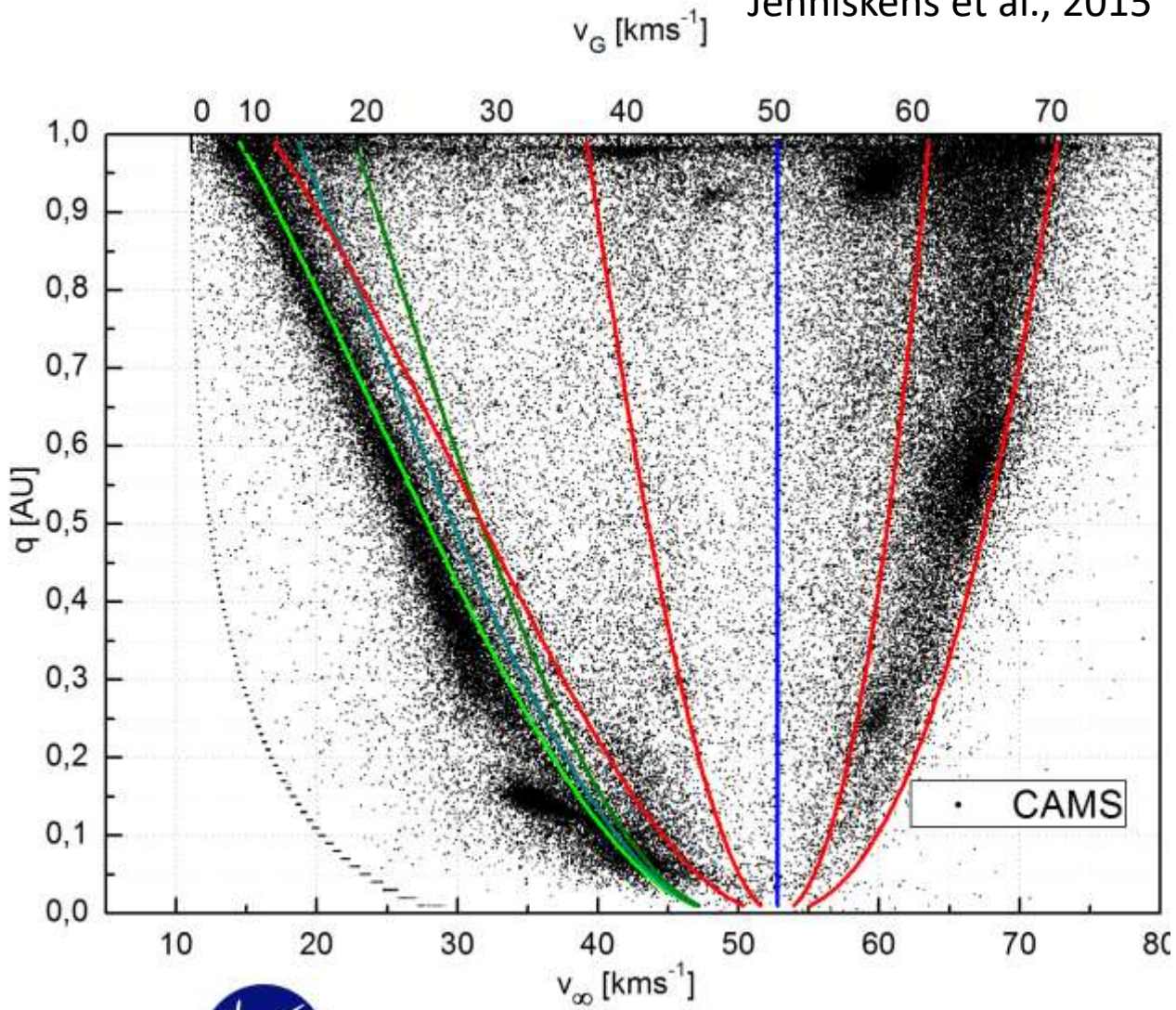
180 deg



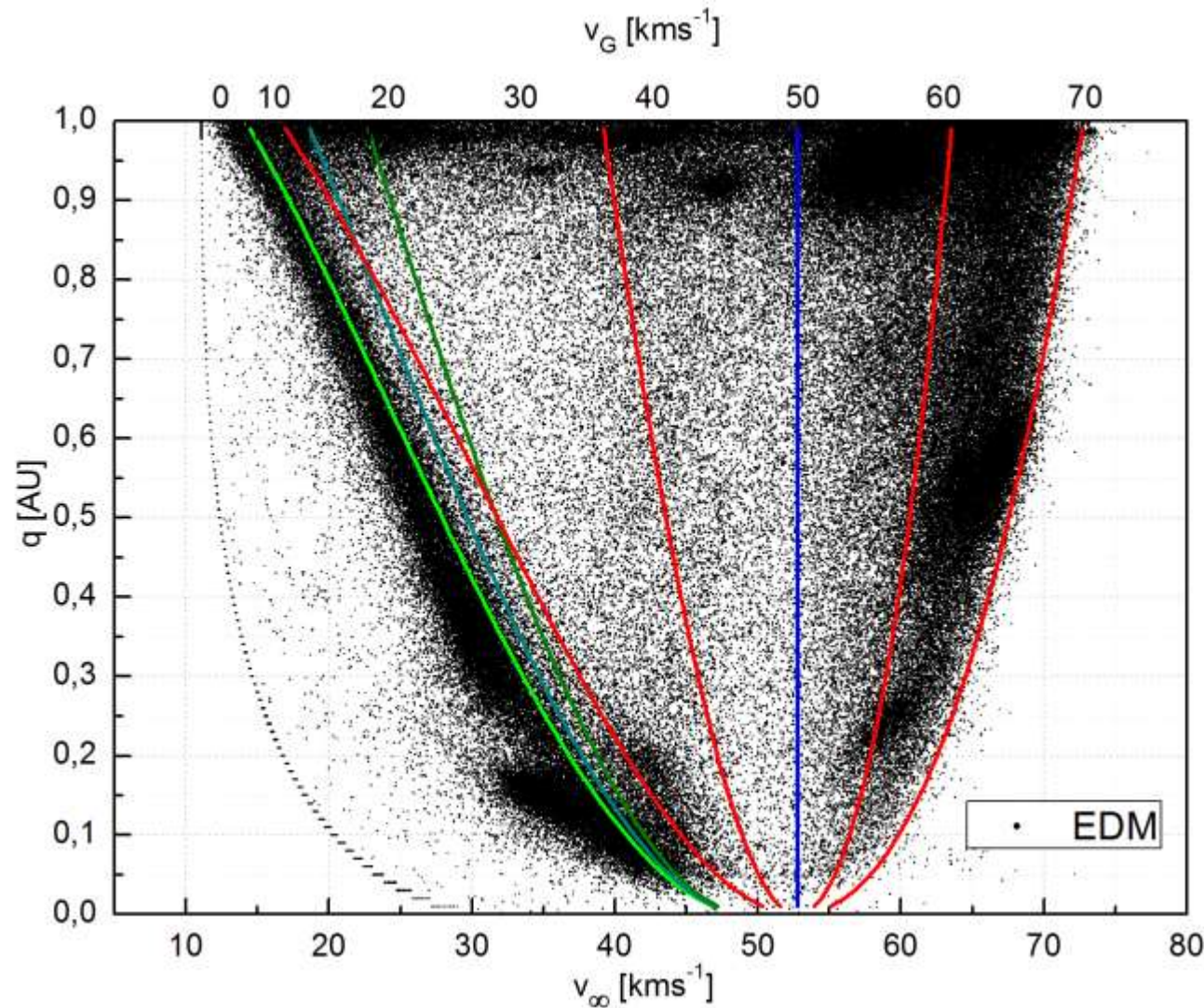
VIDEO METEORS

CAMS: 108 880 orbits

Jenniskens et al., 2015



EDMOND: 251 805 orbits



CONCLUSIONS

INFLUENCE OF ERRORS ON THE RESULTING METEOROID ORBIT



SPURIOUS POPULATION OF ORBITS

best seen on:

- orbits behind the parabolic limit
- orbits corresponding to the gap in the bimodal velocity distribution

examples:

- apparent hyperbolic orbits
- enhancement of low-perihelion orbits of dust observations
- etc.

