On weighting method in modelling of meteoroid stream formation

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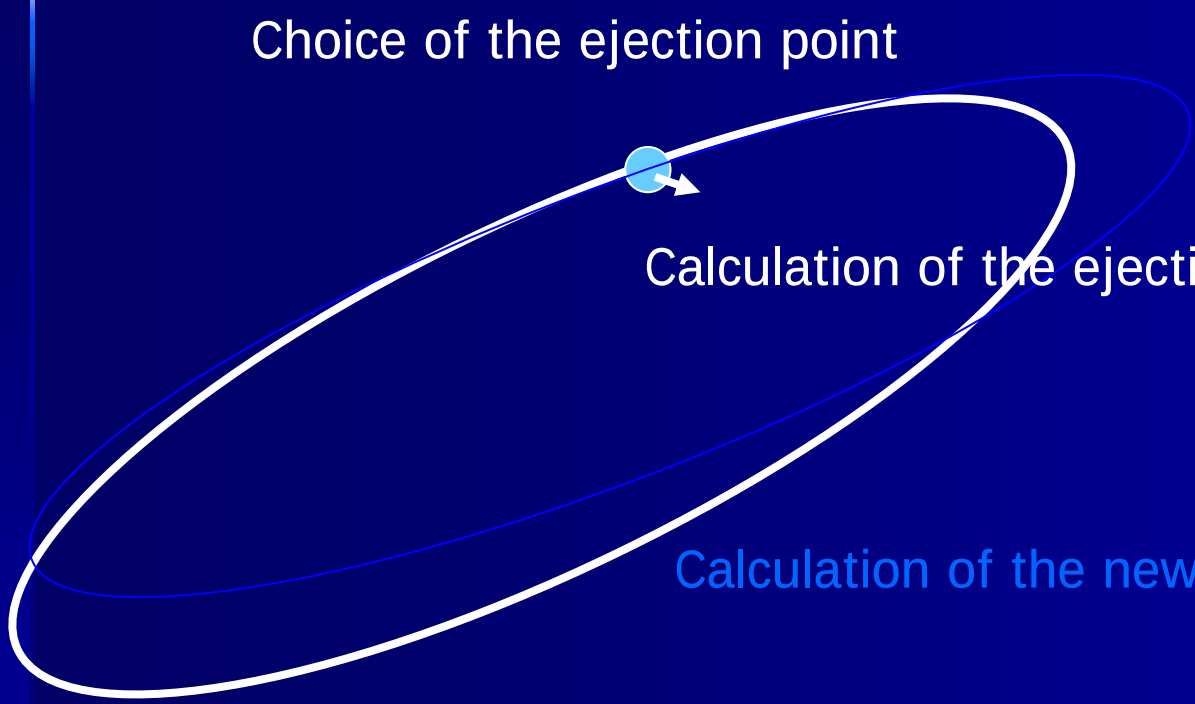
Stages of modelling



Repeating this 10 mln times we get a model meteoroid stream – family of orbits

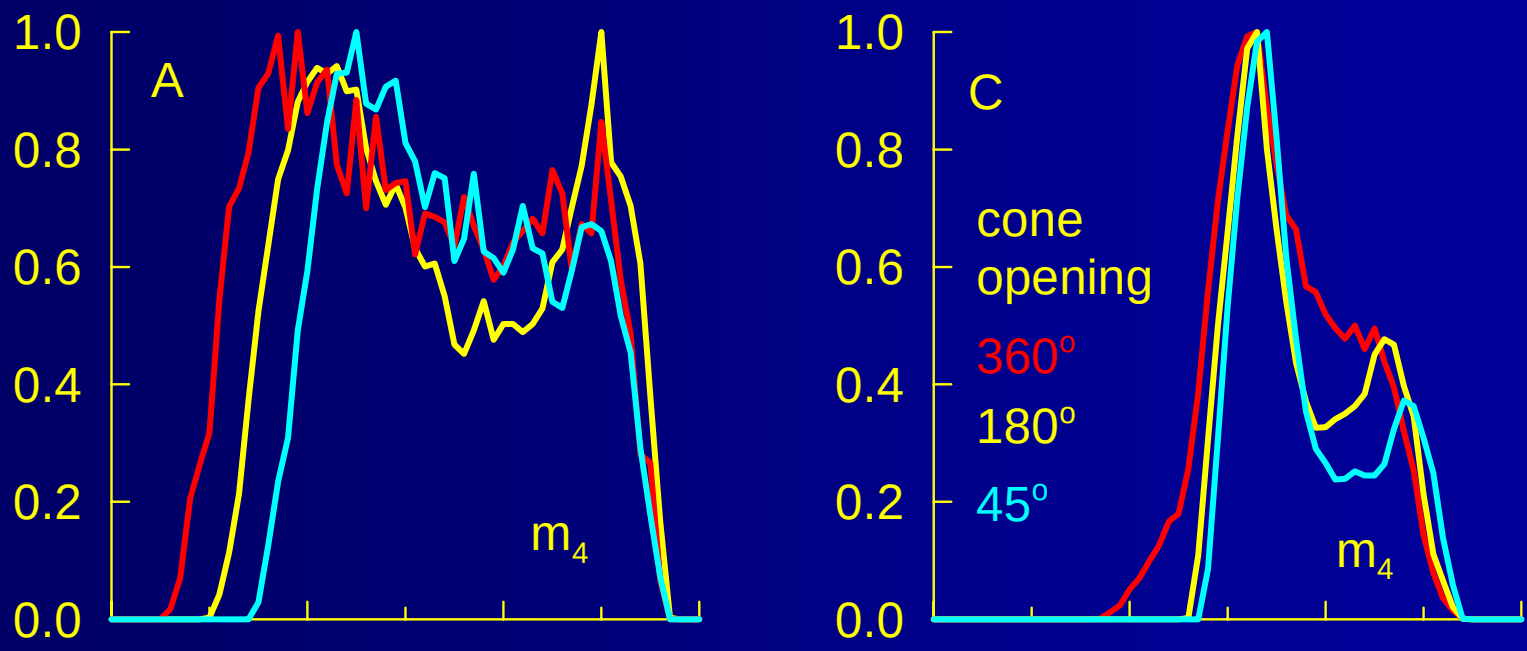
So we have 3 unique parameters for any ejected test particle:

1) Ejection point on the orbit

2) Ejection velocity value

3) Ejection velocity direction

Influence of ejection cone opening on activity profile



Choice of ejection point

A comet dust production rate:

$p(r) = C_n r^{-n}$ $\quad\quad$ $n = -3 \div -4$

Example: We model with $p_4 = C_4 r^{-4}$,
but wish to look also on $p_3 = C_3 r^{-3}$

Weight is $\quad W = p_3 / p_4$

Ejection velocity

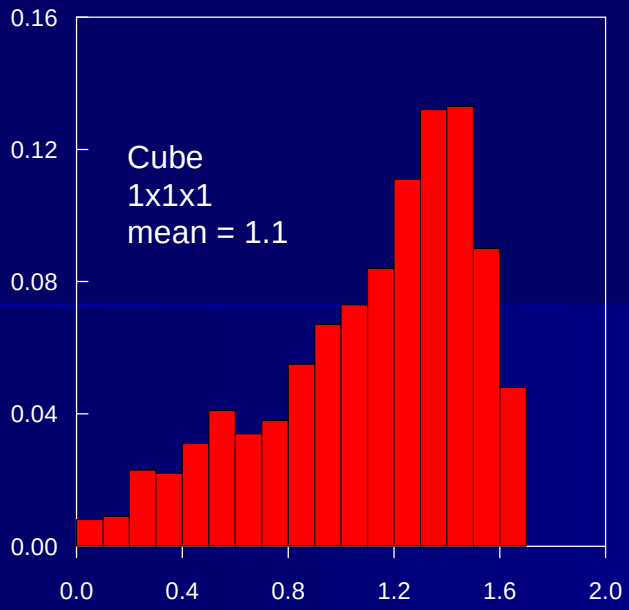
This works only when the velocity value is distributed (i.e. not a single value)

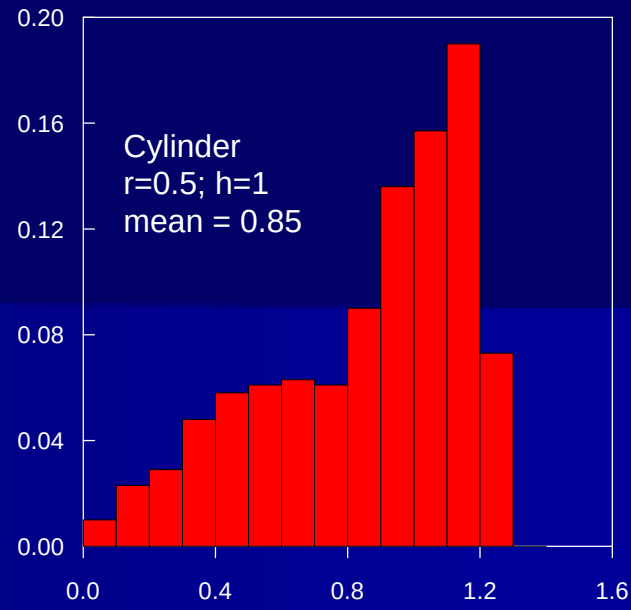
Whipple's formula: $c = f(\ldots\ldots, A/m)$

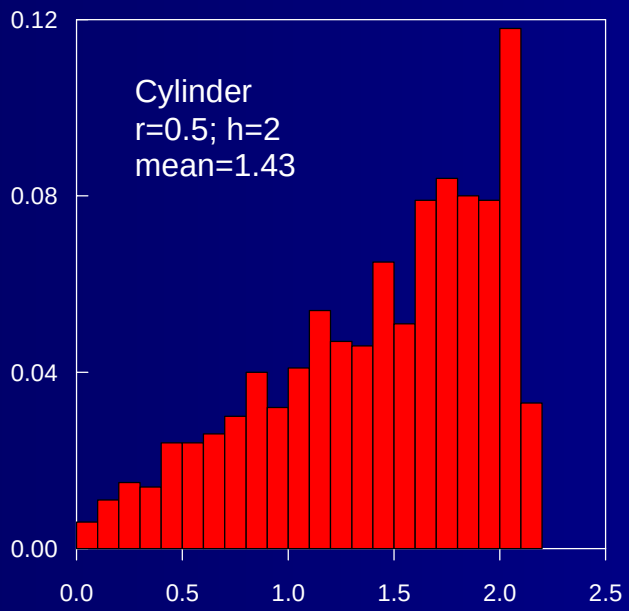
A – particle's cross-section area

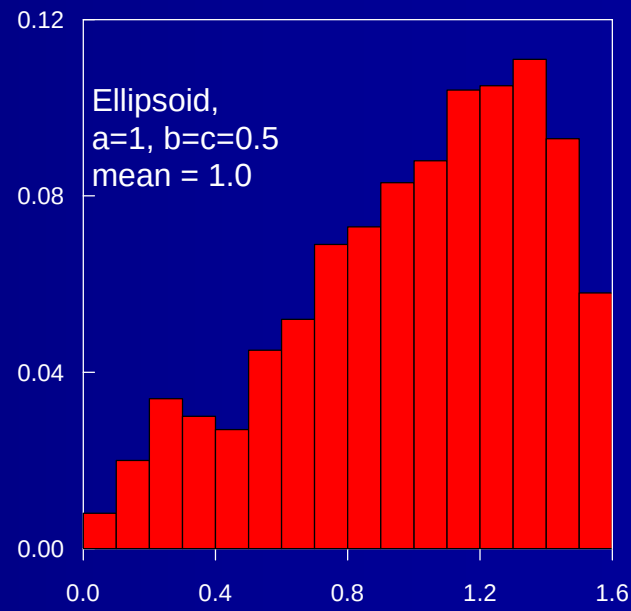
m – particle's mass

So if a particle is not spherical =>


0.16
0.12
0.08
0.04
0.00
0.0
0.4
0.8
1.2
1.6
2.0
Cube
1x1x1
mean = 1.1


0.20
0.16
0.12
0.08
0.04
0.00
0.0
0.4
0.8
1.2
1.6
Cylinder
r=0.5; h=1
mean = 0.85


0.12
0.08
0.04
0.00
0.0
0.5
1.0
1.5
2.0
2.5
Cylinder
r=0.5; h=2
mean=1.43


0.12
0.08
0.04
0.00
0.0
0.4
0.8
1.2
1.6
Ellipsoid,
a=1, b=c=0.5
mean = 1.0