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THE ZONAL DISTRIBUTION
OF COMETS

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Abstract

Comets are not distributed randomly around the Sun, but exhibit a symptomatic zonal distribution when their inclination is related to the equatorial plane of the Sun.

1. Introduction

For the mainstream, the equatorial plane of the Sun does not play any role in cosmology.

However, the Sun rotates faster in its equatorial plane than at higher latitudes!

However, all the orbits of the planets are very close to the equatorial plane of the Sun!

However, the light reflected by the K coronal layer of the Sun is polarized in its equatorial plane!

However, last but not least, it appears that comets are not distributed randomly around the Sun, but exhibit a symptomatic zonal distribution when their inclination is related to the equatorial plane of the Sun!

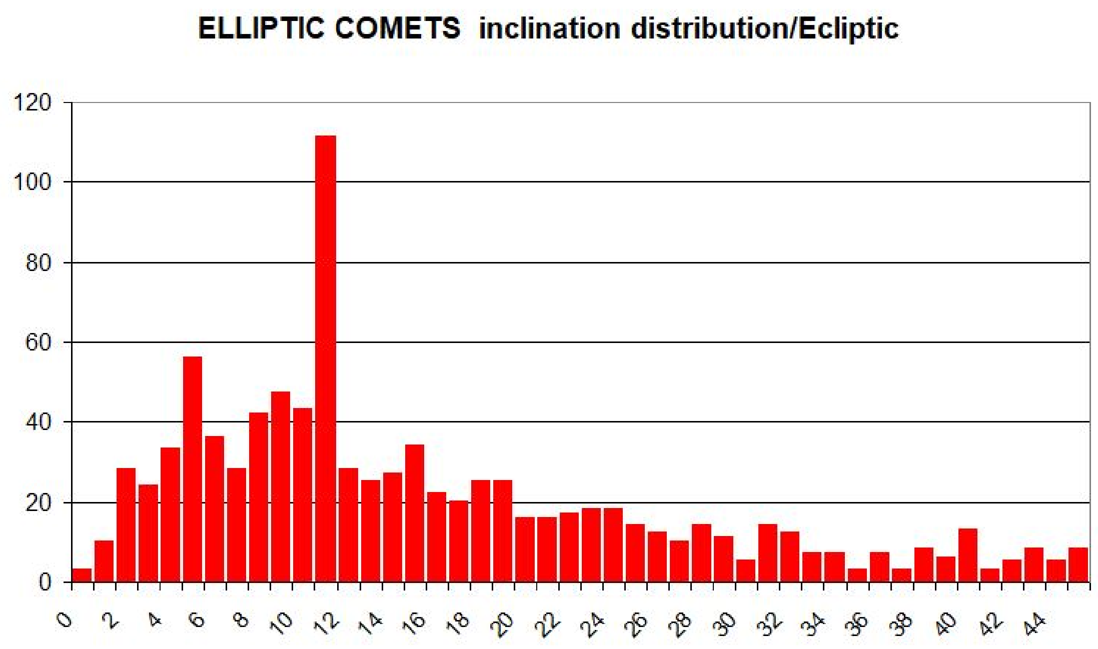
2. The distribution of comets

For custom and convenience, the orbits of the bodies of the solar system are referred to the plane of the ecliptic.

However, this plane does not play any particular role for bodies which revolve around the Sun.

The distribution of the inclination of comets with regards to the plane of the ecliptic is distributed at random with the exception of a peak at 12°. This is also the case of the longitude of the ascending nodes of the orbits. As a result, the corrections to be made to the inclinations referred to the ecliptic to obtain the inclinations with respect to the equatorial plane of the Sun are not uniform.

The NASA GPL site gives the orbital coordinates of comets.



3. Change of coordinates

From the coordinate system linked to the plane of the Ecliptic, we successively have the following coordinate change matrices:

$$\sigma_1 = \begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos I & -\sin I \\ 0 & \sin I & \cos I \end{vmatrix} \qquad \sigma_2 = \begin{vmatrix} \cos\Omega & \sin\Omega & 0 \\ -\sin\Omega & \cos\Omega & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$\sigma_3 = \begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos i & \sin i \\ 0 & -\sin i & \cos i \end{vmatrix} \qquad \sigma_4 = \begin{vmatrix} \cos\alpha & \sin\alpha & 0 \\ -\sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$\sigma_5 = \begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos j & -\sin j \\ 0 & \sin j & \cos j \end{vmatrix} \qquad \sigma_6 = \begin{vmatrix} \cos\varpi & -\sin\varpi & 0 \\ \sin\varpi & \cos\varpi & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

avec:

- I : inclinaison du plan équatorial du Soleil sur l'Ecliptique.
- Ω : longitude de l'astre rapportée au noeud ascendant de l'équateur solaire (= longitude − 73,11°)
- i : inclinaison de l'orbite de l'astre sur l'Ecliptique.
- α : angle mesuré dans le plan de l'orbite de l'astre entre le plan de l'écliptique et l'équateur solaire. (intermédiaire de calcul)
- j : inclinaison de l'orbite de l'astre sur l'équateur solaire.
- ϖ : longitude du noeud ascendant de l'astre, par rapport au noeud ascendant de l'équateur du Soleil, mesuré dans le plan de l'équateur solaire.

$$\sigma_1 * \sigma_2 * \sigma_3 * \sigma_4 * \sigma_5 * \sigma_6 = \begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

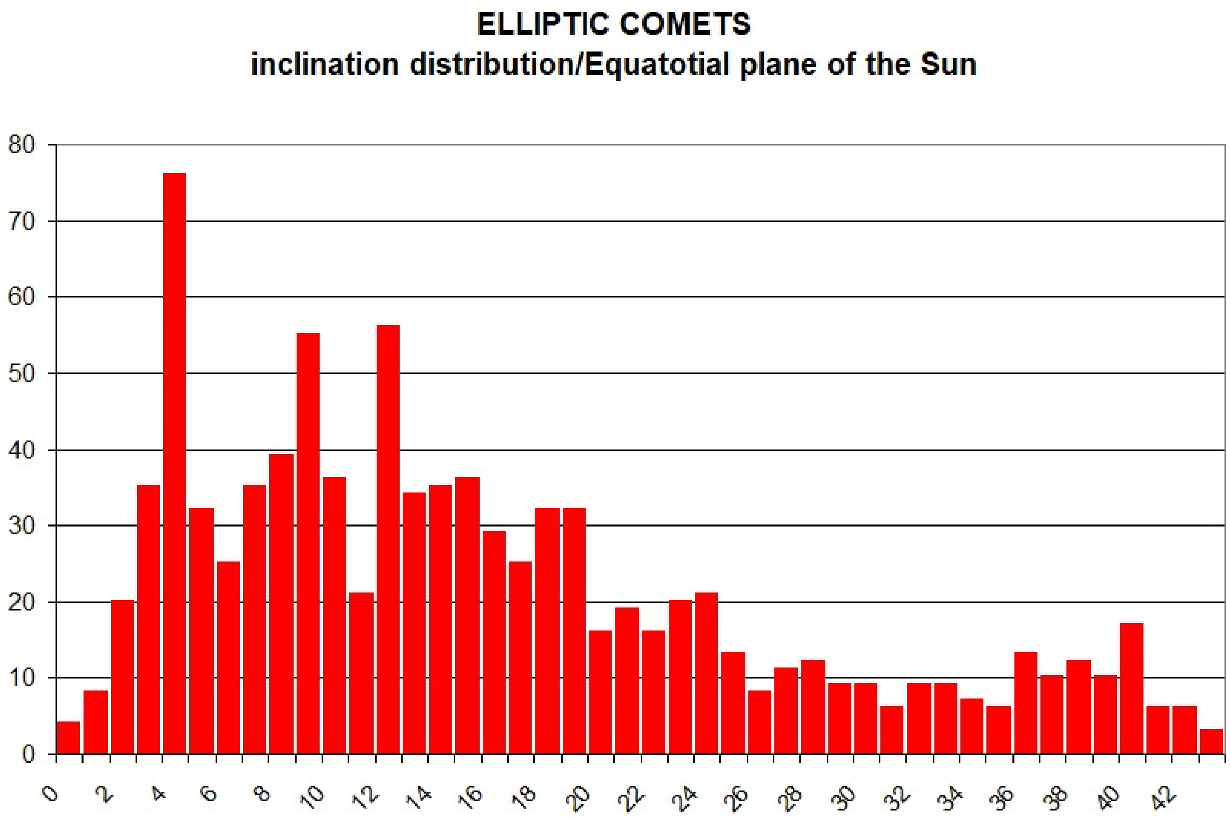
Le terme $n_{3,3}$ donne directement la relation entre j, Ω, i et I :

$$\boxed{\cos j = \sin I \sin i \cos \Omega + \cos I \cos i}$$

4. The distribution of comets inclination with regards to the equatorial plane of the Sun

The statistical analysis of the inclinations of comets, with respect to the equatorial plane of the Sun, leads to the observation of symptomatic anomalies.

The following curve shows a density gap between 0° and 3° followed by a maximum between 3° and 6°. Then there is a second characterized gap between 6° and 8°. Another high density area extends between 9° and 11°. It is followed by a gap between 11° and 12° and a peak between 12° and 14° .



The maximum and the gap which follow are less characterized.

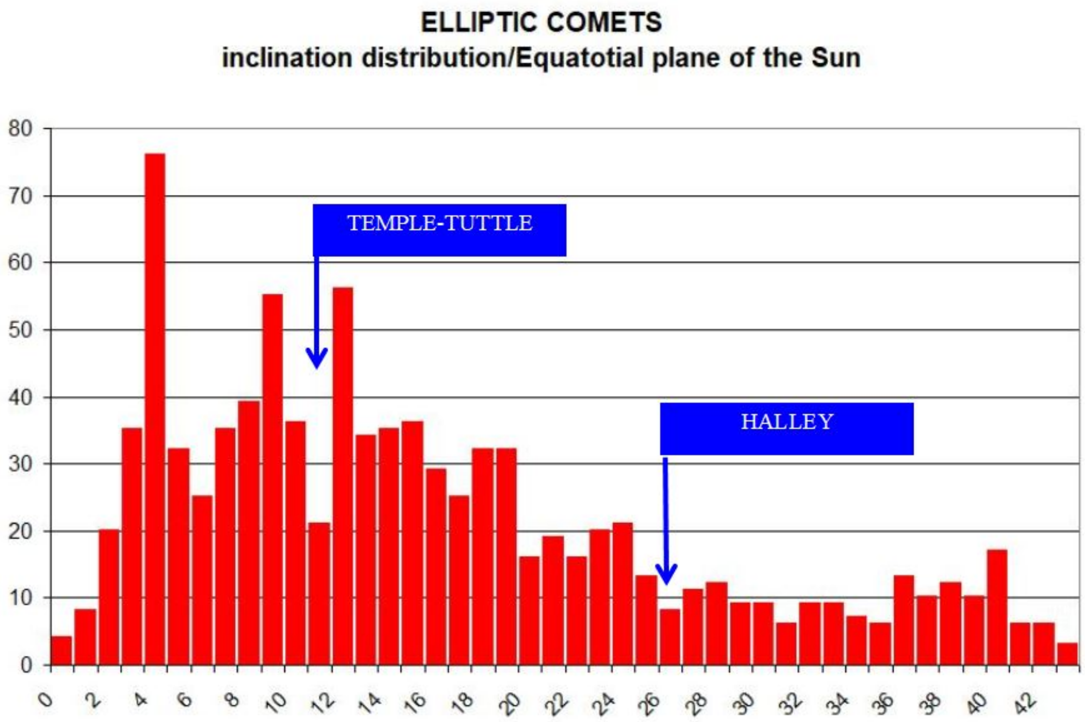
These anomalies are not very sensitive to the change of the reference plane within limits of a few degrees around the equatorial plane of the Sun, whether the change is obtained by modification of the inclination with respect to the ecliptic or by modification of the longitude, or of the two at a time.

On the other hand, they lose their statistically significant character for more distant reference planes.

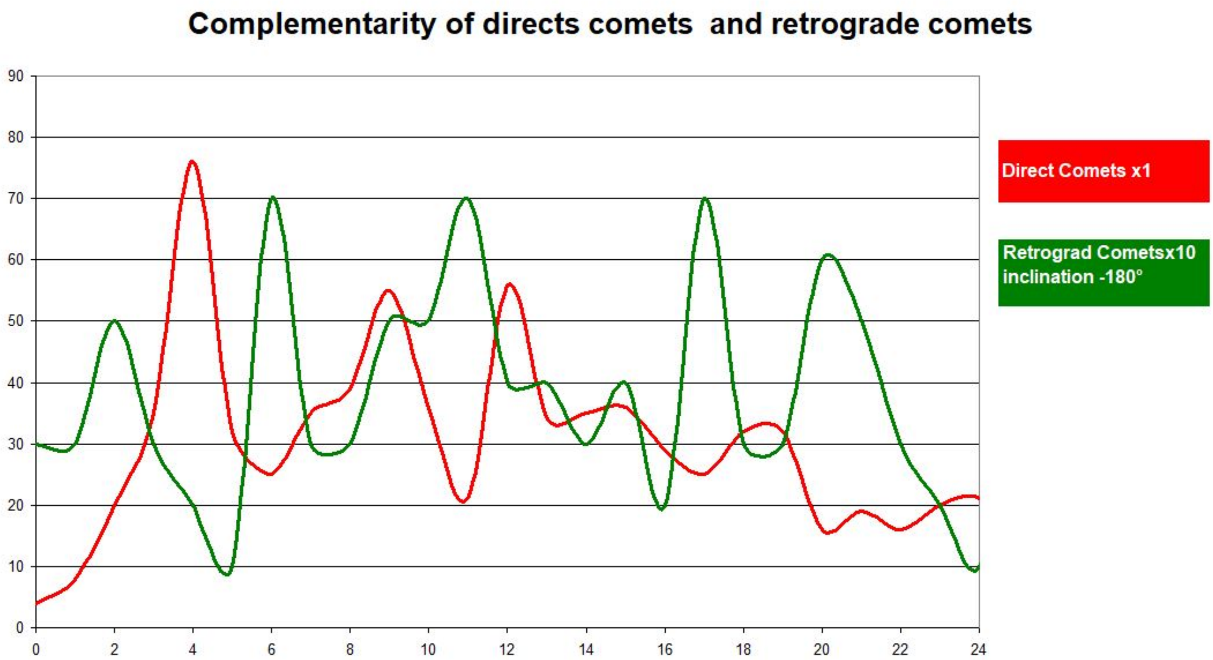
5. The distribution of retrograde comets inclination with regards to the equatorial plane of the Sun

Moreover, a coincidence cannot fail to escape the examination of the anomalies of the densities of comets as a function of the inclination with respect to the equatorial plane of the Sun.

Temple-Tuttle is retrograde. Its inclination in relation to the equatorial plane of the Sun is 169.32° That is to say that the plane of its orbit merges with the plane of a direct orbit whose inclination would be 10.68°. This inclination is found in the third gap. Halley is in another gap.

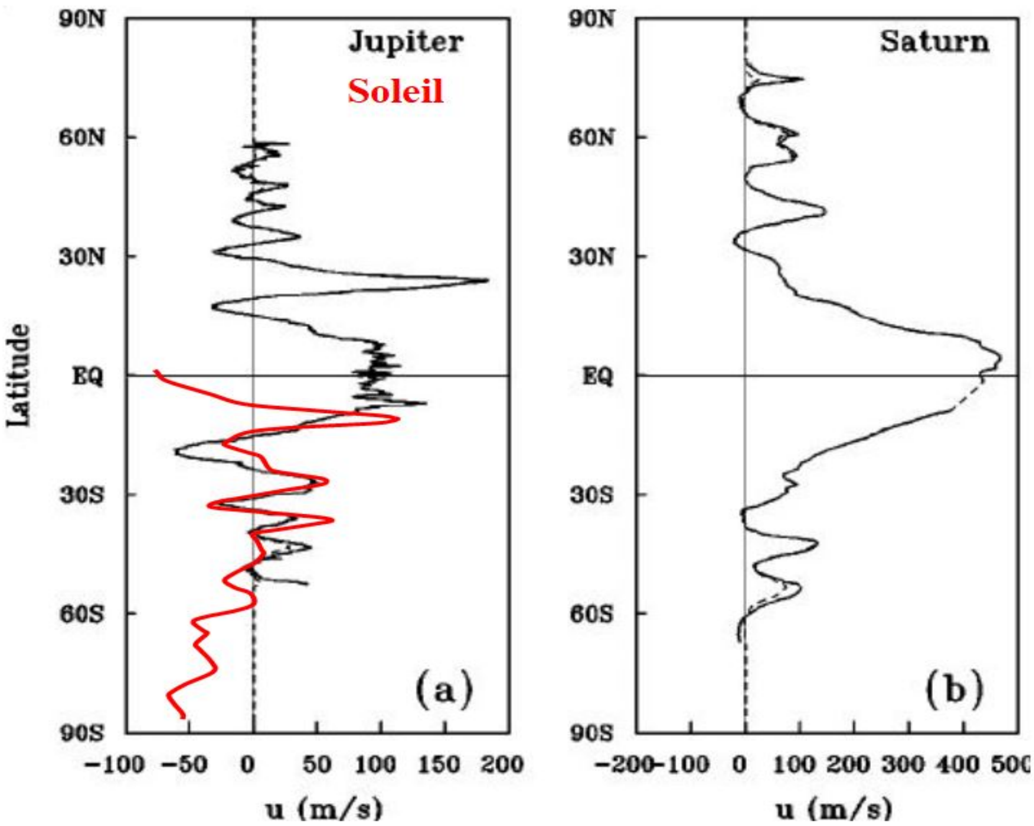


The two following curves show an undeniable complementarity between the distribution of direct comets and that of retrograde comets. For comparison, the inclinations of retrograde comets have been assimilated to those of direct comets in the same plane, therefore reduced by 180°.



6. The zones of the Sun and Planets

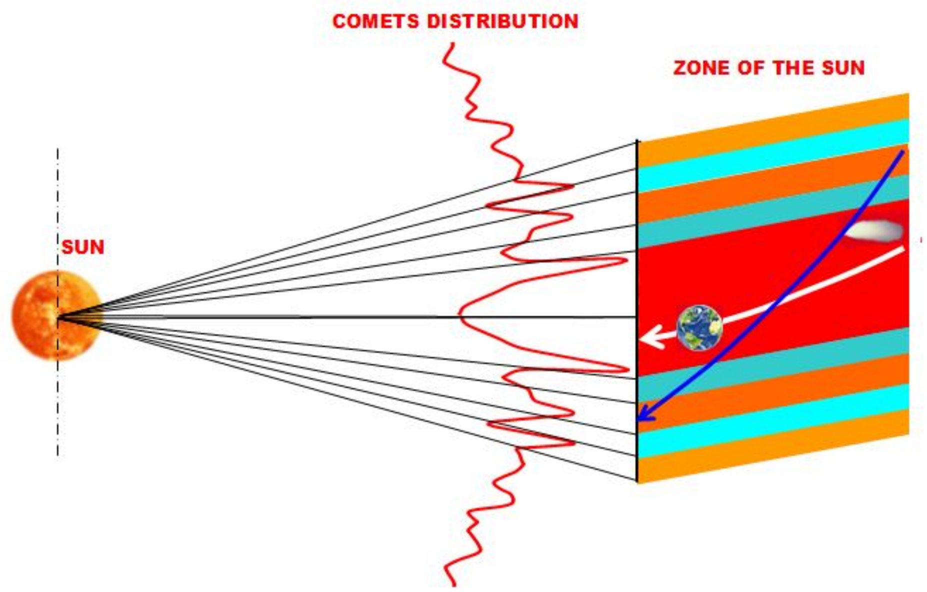
Finally, there is a striking analogy between the distribution curve of comets referred to the equatorial plane of the Sun and the curve of gas velocities around Jupiter.



7. Conclusion

The most surprising is the virtual absence of bodies gravitating in the vicinity of the equatorial plane of the Sun. This is all the more surprising given that the stars orbiting in galaxies are practically all found in their main plane and that the rings of the planets are precisely in their equatorial plane.

The second fundamental phenomenon is the zonal distribution of bodies. These zones show a striking correspondence with the zonal atmospheric circulation of the gaseous planets. Correspondence enhanced by the complementary distribution of retrograde comets with regards to direct comets



It should be noted also that the zoning of comets is limited in inclination by the fact that the orbits are not entirely contained in one zone. Each side of the equatorial zone, in red on the sketch, parts of the trajectories are covered in the other zones.

Of course these zonal properties lead to Descartes vortices theory, that is to say, once more, to Fluid Mechanics. This is the view on physics opposite of the mathematical approach initiated by Newton. Even more, mathematics are unable to explain correctly the simplest flows such as the flow towards a well. Fluid Mechanics presently rely mainly on digital simulation. An old world baths in the ultimate tools.

8. References

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