THE ALLAIS ECLIPSE EFFECT AND THE SECULAR ADVANCES OF THE NODE OF VENUS AND THE PERIHELION OF MARS

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Abstract
In the present work, we try to explain the discordances regarding the secular advances of the node of Venus and the perihelion of Mars. We assume that these two discordances concerning the two neighboring planets of the Earth can be explained by an increase of the astronomical unit (AU), resulting from the hypothesis of the Allais eclipse effect. In a previous article [1], we supposed that the eclipses were the causes rather than the witnesses of the withdrawal of the Moon from the Earth and, at the same time, of the remoteness of the Earth-Moon system from the sun. The remoteness of the Earth-Moon system increases the AU, i.e. the Earth-Sun distance, of about 10 meters per century, which approaches the Earth from Mars and moves it away from Venus. Becoming closer from Mars contributes to the advance of the perihelion of Mars that is 8" per century and the distancing of Venus helps to the advance the Venus node that is 10" per century (value of the advances expressed in arcseconds).

Key words: advance of the perihelion of Mars, advance of the node of Venus, Newton theory, Relativity, eclipses, Allais eclipse effect, AU

1 Introduction

Since the beginning of the 21st century, the accuracy of the images that send us space probes makes science forward significantly by overcoming the mysteries of the solar system. It is clear that despite good results, the darkness stays still thicker on some enigmas, such as the secular advances of the node of Venus and perihelion of Mars.

During the second half of 19th century, the very few disagreements between the Newtonian predictions and observations concerned the motion of the inner planets. Le Verrier and Newcomb got three discordances between Newtonian theory of planets and observation. These are the perihelion of Mercury, the node of Venus and the perihelion of Mars. Newcomb gave an advance of the node of Venus of 10" and an advance of the perihelion of Mars of 8" per century. While these two differences between the Newtonian theory of motion of planets and observations are always remained in disagreement with the theory of Relativity, it was otherwise for the issue of Mercury perihelion advance of approximately 43" per century which was explained by the Relativity [2].

According to Newton's law, the trajectory of a planet subject to the solar attraction is a fixed ellipse with the Sun at one focus. At that solar attraction are added much lower forces exerted by other planets that disrupt the elliptical orbit. The main effect of these disturbances is a rotation of the orbit which is described by a precession of the perihelion, the closest point on the Sun's trajectory. In 1850, Le Verrier had found that the measured advance of the perihelion of Mercury was higher (38" per century) than the one calculated. The determinations of Newcomb (1898) have further accentuated this disagreement which passed to 43" by century, value confirmed by additional observations: The orbit of Mercury presents a residual advance of perihelion of 43.11" ± 0.45" by century, whose perturbations cannot be observed in a Newtonian frame of reference [3]. Relativity has solved this old riddle posed by

the eccentric behavior of the planet Mercury. Instead of turning in its elliptical orb with the regularity of the other planets, Mercury deviates from its course by one degree every year, very light but invariable. It is a small high-speed planet, the innermost of the solar system. Conforming to Newton's laws, these factors could not in themselves explain the deviation because the dynamic laws of the movement of Mercury have to be the same that those of the other planets. But according to the laws of the gravitation of Einstein, the intensity of the gravitational field of the Sun and the enormous speed of Mercury make all the difference, leading the ellipse around the orbit of Mercury to execute a slow movement around the Sun at the rate of a revolution for three million years [4]. In 1915, Einstein calculates the trajectory of Mercury with General Relativity. He finds that his theory eliminates exactly the existing discord: in General Relativity, the trajectory of Mercury around the Sun is an ellipse of which the advance of the perihelion is 43".02 per century [3]. 6000 observations of Mercury made between 1900 and 1940 brought a strict confirmation of the conclusions drawn earlier observations.

The relativistic effect on the perihelion of the Earth and Mars is indisputable ever since the detailed studies that have been done by HR Morgan (1945) and Clemence (1952) and thanks to the computing facilities, but is nevertheless much less sensitive [5].

Before Relativity, various hypotheses had been issued to resolve these discordances. Simon Newcomb, in his book «*The elements of the four inner planets and the fundamental constants of astronomy*», discusses different explanations for the Mercury's perihelion which exceeded five times the probable error and had an advance being worth about 43".02 per century, the node of Venus with a secular advance nearly 10".14 which overtakes five times the probable error and the perihelion of Mars with a neighboring advance of 8".03 per century which outdoes three times the probable error. Among others, Newcomb connects by means of Hall's hypothesis the advances of the perihelion of Mercury and Mars, and reduces the advance of the node of Venus by diminishing the mass of the Earth. Hall's hypothesis consists in admitting that the mutual attractions of the Sun and the planets are in inverse reason of a power of these distances slightly superior to 2, and to choose this exponent so that the secular advances of the perihelion of Mercury and Mars relative to the Newtonian theory are brought to 42".05 et 9".1 and that the advance of the node of Venus is reduced to 4".22 [6, 2].

However, one finds the advance of the perihelion of Mercury ~43", in the theory of Relativity, with the law of gravitation deducted from Schwarzschild ds^2, what is almost contradictory to the beginnings of Hall's hypothesis. Because Relativity was favored, it took reject the discussion of Newcomb on the hypothesis of Hall, and moreover also the other former explanations for discrepancies between theory and observation [2].

Nevertheless, with the theory of Relativity, the perihelion of Mars picks up only an insensitive advance of 1".35 by century and the node of Venus has no sensitive advance. To return to the calculations of Le Verrier, Newcomb, of Doolittle (by a different method) and Ross [2], which are confirmed, it should be remembered that in the case of Mars, there was general agreement to say that the advance of the perihelion of Mars could be greater and consistent with observations by the action of asteroids or an increase in the mass of the Earth. And in the case of Venus, the consensus was to declare that we could reduce, as Newcomb, or cancel the incomprehensible advance of the node of Venus by decrement of the mass of the Earth.

In this paper, we seek to construe the anomalies regarding the secular advances of the node of Venus and the perihelion of Mars, on the assumption that these two discordances concerning

the two neighboring planets of Earth are elucidated by an increase of the AU, resulting from the Allais eclipse effect.

2   The growth of the AU caused by the Allais eclipse effect

A possible antigravity effect of the Sun-Earth-Moon system's gravity while the Moon is in front of the Sun was first noticed by Prof Maurice Allais over 60 years ago when its paraconical Foucault-type changes its plane of swing by up to 13.5°. What corresponds to an acceleration of the gravity on the Earth's surface of 9.4554 m/s^2 [7, 8]. We have shown in paper [1] that the Allais eclipse effect causes the major part of the growth of the length scale for the entire solar system. It is the rough disturbance on the barycenter Earth-Moon implying the Sun that was recorded in the movement of the paraconical pendulum. Earth and Moon revolve around their common center of gravity, which in turn orbits the Sun, and the perturbation of the eclipse hits this double, coupled Kepler's movements. The thesis of the tidal friction supports that oceanic tidal friction transfers the angular momentum of the Earth to the Moon, slows down the rotation of the Earth while taking away the Moon. However, we think that there are not enough shallow seas to sanction this interpretation. The Earth-Moon tidal system might be inaccurate or unreliable in determining the Earth's actual rotational spin-down rate. Our assertion is that the change in the Earth's rotation is caused by a repulsive gravitational interaction during solar eclipse.

The listed total solar eclipses were always the only «historic witnesses» of the non uniform change of rate of the rotation of the Earth and of the day length. In the past, the Moon was closer to the Earth, which was verified by calculating the distance Earth-Moon from the Assyrian-Babylonian chronicles describing the precise time and location of eclipses 1,000 years BC [9]. We think that eclipses were more than witnesses, they were also the *perpetrators* of these changes in Earth dynamics [8, 10].

This led us to suggest that the slowing rotation of the Earth and lengthening of Earth's day associated with the enlarged lunar orbit were mostly caused by the disturbances of eclipses rather than by the friction of the ocean tides. The perturbation would submit to variations and distortions the region of the barycenter of the Earth-Moon system which revolves around the Sun, with the dual secular effects that the Moon spirals outwards and that the Earth-Moon system goes away from the Sun. Thus, the orbit of the Moon outward drift of about 3.8 cm per year and the length scale for the solar system, the AU, is growing at a rate of about 7 cm per year.

The analysis of radiometric measurements of distances between the Earth and the major planets from 1961 to 2003, including observations from orbiters and landers placed on Mars by the space mission Viking and Pathfinder at the end of the seventies, allowed the astronomers to measure exactly its remote and deduce from it the value of the AU: 149 597 870,691 km ± 30 m. According to the measures made by the Martian probes, the AU would increase about 10 m/cy [11, 12]. These estimates were made from many measurements with sources of errors, so they were likely to vary. Around 2004, three different research groups analyzed the radio echoes from the planets. By compiling over two hundred thousand observations, astronomers G.A. Krasinsky and V.A. Brumberg concluded that the AU was growing at about 15 ± 4 m/cy. Elena Pitjeva of St. Petersburg found: AU: 149 597 870.696 km ± 0.1 m. Independently, E.M. Standish estimates the change as about 5 cm/yr [13, 14, 15]. Later estimates based on both radiometric and angular observations lowered this estimate to

+7 ± 2 m/cy. The International Astronomical Union (IAU) currently accepted best estimate (2009) of the value of the AU is 149 597 870 700 m.

3 The increase in the Earth-Sun distance explains the secular advances of the perihelion of Mars and the node of Venus

The perihelion of the orbit of Mars moves forward by century of 1600 " approximately that we cannot find exactly by calculation. This total secular advance of about 1600" comes from the action of the other seven planets on the perihelion of Mars. According to the theory of Relativity, the perihelion of Mars obtains only an insensitive advance of 1".35 per century while the observation of Newcomb (1895) indicates 8". The value provided by Relativity has the desired sign, but remains quite inadequate. It gives a fraction of about one-sixth of the advance of the perihelion of Mars. To complete the theory, it was assumed that the advance of the perihelion of Mars was due to the action of asteroids. Note that if one makes the correction of 8" − 1".35 = 6".65, we obtain for the secular advance of the perihelion of Mars a number having a value in absolute figure close to the secular advance of the node of Venus [2].

We think that the increase of the AU, resulting from the hypothesis of the Allais eclipse effect, can contribute to explain the remaining advance of 8". The distance Earth-sun (10 meters by century) augmented by the action of eclipses − equivalent to a group of planetoids circulating between the Earth and the Mars − would increase appreciably the advance of the perihelion of Mars. The increment would mean that the Earth-moon mass becomes closer to Mars, what would be consistent with the proposal of the astronomers wanting that a more massive Earth bridges the gap.

The line of nodes of Venus (line along which the Venus orbit cuts the ecliptic plane) moves back of an angle of the order of 1000" per century. It is necessary to understand that this backward motion results from the action on the node of Venus of all the planets, except Mercury. It is a retrograde motion or a delay (clockwise). But the calculation does not fully find the total secular delay of this node which goes beyond 1000". It remains an unexplained residue of approximately 10" per century, considered in a counterclockwise direction, thus an advance of the node of 10".

Now, eclipses as a whole would have the effect of increasing the AU (as demonstrated by the laser measurements), which implies a derivation of the Earth-Moon system from Venus that would provoke on the node a contrary motion relative to the inertial system, a kind of negative precession: the advance of the node of Venus that is 10" per century. So, the distance Earth-sun being slightly greater, we can say that the speed of the Earth is slightly lower. Therefore, Venus, during the secular transits, goes slightly faster relative to Earth's speed and presents this hitherto unexplained residual advance. Although the extension of the AU affects neither the speed nor the distance Venus-Sun, it affects the passage of the planet Venus between the Earth and the Sun, where the shadow of Venus appears in front of the solar disk. Historically, the observation of the transit of Venus was the most convenient method for determining the value of Earth-Sun distance. Verifying that this value grows at the rhythm of eclipses changes the situation: The Earth-moon mass moves away slightly from the Sun, from Venus necessarily, what is equivalent to a reduction of the mass of the Earth which would induce a direct motion (or an advance) to the node of Venus.

Even if the passage of Newton's law to Einstein's law does not introduce any secular inequality neither on major axis, nor on the eccentricities, nor on longitudes of nodes, the growth of the UA, resulting from the hypothesis of the Allais eclipse effect, corrects the disagreement concerning the secular advance of the node of Venus. The perihelion of Venus gets the advance given by Newcomb, 10".14 per century. The same increase improves the weak calculated advance of the perihelion of Mars of 1".35 per century relative to the observation of 8".03.

Conclusion

Who could believe that in the 21st century, after the immense works of Le Verrier, Tisserand, Newcomb, Doolittle, Einstein, that the advances of the node of Venus and the perihelion of Mars are still problems in physical astronomy? Astronomers had studied all possible factors that can cause these fluctuations, but had found no solution within the framework of the theory of Newton. It seems that the passage from Newtonian attraction to the theory of Relativity was not able to introduce sensitive secular motions of the nodes of the planets and that the perihelion of Mars earns only an insensitive advance of 1".35 per century. After more than three centuries, science considers more and more these two anomalies as negligible amounts instead of trying to come to approached solutions.

We tried to seize these discrepancies by highlighting an explanation that we could not know previously: the hypothesis of an Allais eclipse effect, according to which the eclipses, acting like "pyromaniac firemen", would have provoked throughout the centuries the increase of the distance Earth-sun. It constitutes an interesting approach regarding inexplicable secular advances of the perihelion of Mars and the node of Venus by showing in first approximation, that the perihelion of Mars, disrupted by the Earth which gets closer to her, undergoes a secular advance, and that the node of Venus, perturbed by the plan of the Earth which moves further, undergoes a secular advance of absolute value almost equal [2].

If the final goal of Celestial Mechanics is to solve the question to know whether Newton's law and Einstein's law alone can explain all astronomical phenomena, the answer is no. One can feel the utmost importance from the point of view of the theory of Relativity and Celestial Mechanics that a new explanation of the differences of Venus and Mars would bring to Newton's law in the planetary motions. We think that the Allais eclipse effect [7, 16] could be the key to the solution and that the renunciation to the sort of conjuration of oblivion surrounding the work of Maurice Allais is the price to pay to satisfy the requirement to understand the incompatibility of the hypotheses.

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