Blue Clearing without Allais Effect

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Abstract

Normally observations of planet Mars through a blue filter give images with very low contrast. However, when Earth is on the line between Sun and Mars, the blue picture on Mars is improved. This is called Blue Clearing and is said to be an improvement in the transmission of light in the atmosphere of Mars. An alternative interpretation is given here. This interpretation is independent of the Allais effect. It is assumed here that the Allais effect is a shielding effect in gravity. This assumes a pushing gravity of the kind described by Le Sage.

Background

Pictures of Mars through a blue filter reveal often only extent of polar ice and clouds due to low contrast. However, during an opposition of Mars in relation to Sun the pictures can reveal structures on the surface of Mars. This phenomenon is described by Russell Bagdoo in [1]. He suggests an intimate relation between this Blue Clearing and the gravitational Allais effect. Russell states also that Blue Clearing is not well understood.

The Allais effect is observed during a solar eclipse. The effect lasts for a time in the order of about one hour, which is about the time it takes for a line connecting Earth and Moon to move over the surface of Sun. The time for a line connecting Mars and Earth to move over the Sun is in the order of one day.

Blue Clearing

When the atmosphere of our planet is exposed to sunlight the atmosphere emits blue light. This is the reason why the heaven is blue during daytime. It seems reasonable to assume that the atmosphere of Mars also can emit blue light. This emission can therefore cause the low contrast in normal conditions. The atmosphere of Mars has a very low density and is very different from the atmosphere of our planet. It is therefore possible that the emission from the Martian atmosphere can be very low and of about the same magnitude as the reflected sunlight from the surface of Mars for short wavelengths of light. The image of Mars can be composed of a combination of reflected and emitted light.

There is an important difference between emitted and reflected light. Emitted light has the same intensity in all directions. Reflected light has a maximum direction when light is observed from the same direction from where the planet is illuminated. This means that near an opposition reflected sunlight can be dominating over emitted Martian light due to a better illumination angle. Far away from opposition Martian light dominates and provides an image of lower contrast. Therefore, image properties depend on the angle between illumination and observation. The directivity of reflected light is not very sharp and that means that Blue Clearing can last for many days. If Blue Clearing was caused by the Allais effect we could expect a duration of about one day only – as earlier said based on a gravity model according to ideas from Le Sage.

The Allais Effect

The Allais effect is also an effect that is without a clear explanation. Since the effect is observed in a pendulum with a complex behavior it is not easy to relate the observation to a numerical value on the change in gravity. However, a behavior of the same duration in time was observed in China in 1997. See [2]. A sensitive gravimeter detected changes in gravity between 10^{-9} and 10^{-8} during an eclipse. The effect can be explained by gravitational shielding if pushing gravity is assumed – in agreement to Le Sage's model. This method, based on a gravimeter, is suitable for eclipses in high elevation angles.

However, eclipses in low elevation angles can be detected with very simple equipment. Horizontal motions of a mass have been detected during an eclipse. Janos Rohan has reported such an experiment. See [3]. A motion in the order of 0.3 m was detected. Effects according to [2] and [3] are easy to relate to changes in gravity. However, detection according to [3] is very sensitive to weather conditions. Therefore, it is better to detect horizontal motions of a weight hanging in a very long wire. This can be done underground in a mine. Detection can be done without humans or other disturbances in the neighborhood.

When interpreting this kind of gravitational shielding effect we must remember that we detect only the difference between the effect in a test mass and the effect on surrounding parts of our planet – of the size of our moon. This means the difference between the value in a point and a kind of averaging over larger masses. The result can therefore be small and bipolar. We can have an effect in the middle of the eclipse and effects of opposite sign before and after.

Summery

The title 'Blue Clearing' can be limiting to our thinking. Perhaps the effect is not about clearing but instead about illumination. Instead of an improvement in atmospheric transmission on Mars we can assume better illumination for shorter wavelengths during opposition. The illumination from our sun is most effective if we observe from the same direction as the illumination from the Sun.

Remarks

I Images – through a blue filter – of Mars should be analyzed in relation to this theory.

II We should do more tests with gravimeters during solar eclipses in high elevation angles.

III Motions of a weight hanging in a very long wire underground in an empty mine should be recorded during a solar eclipse in a low elevation angle.

References

[1] Russell Bagdoo, "MARS BLUE CLEARING AND ALLAIS EFFECT", The General Science Journal (2015).

[2] Qian-Shen Wang, "Precise Measurements of Gravity Variations during a Total Solar Eclipse", Physical review D 62 041101-1.

[3] Janos Rohan, http://astrojan.zz.mu/laki.htm