INCOMPATIBLE SOLAR ALTITUDE ANGLE DURING THE APOLLO 11 EVA FROM ELEMENTARY ECLIPTIC CALCULATIONS.

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Abstract. From elementary ecliptic calculations, we found a solar altitude angle of 07.75° (not more than 09.75° with respect to the ground of the Tranquility base) instead of a minimal solar altitude angle of 16.2° at the official lunar landing site (Tranquility base) during the Apollo 11 EVA (extravehicular activity). Since the sidereal rotation period of the moon is particularly large, during the period were both astronauts were outside the Lunar Module of the Apollo 11 mission, the solar angle variation in the lunar sky was only 0.888°. Moreover, the smaller solar altitude angle, the larger absolute precision of the solar altitude angle is reached by the shadow measurements on a horizontal surface.

The official ending time of the Apollo 11 EVA (extravehicular activity) was $t_{A11} = 1969 - 07 - 21\ 05 : 11 : 00\ UTC$. We have chosen that precise time for all the ecliptic coordinates involved in the present article since the sun was rising at that time and at the Apollo 11 lunar landing site (Tranquility base). Both astronauts of the Apollo 11 mission were outside the Lunar Module during 1.62 consecutive hours at the lunar landing site. Since the sidereal rotation period of the moon is particularly large, during the period were both astronauts were outside the Lunar Module of the Apollo 11 mission, the solar angle variation in the lunar sky was only 0.888°. Moreover, the smaller solar altitude angle, the larger absolute precision of the solar altitude angle is reached by the shadow measurements on a horizontal surface.

The ecliptic coordinates ($J2000.0$) of the moon at t_{A11} is (Stellarium 0.18.0):

$$(l, b) = (193°07', -01°37') \tag{1}$$

The Cartesian unit vector of the moon position at t_{A11} is:

$$e_r = (Cos\,(b)\,Cos\,(l)\,, Cos\,(b)\,Sin\,(l)\,, Sin\,(b)) \tag{2}$$

$$= (-0.973522, -0.226844, -0.0282124) \tag{3}$$

The ecliptic coordinates ($J2000.0$) of the lunar north pole at t_{A11} is the following, with the approximation of a major standstill (29th March 1969) and with an opposite tilt of the moon's orbital plane of 5.145°:

$$(l, b) = (-90°00', 90°00' - 05.145°) \tag{4}$$

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The Cartesian unit vector of the lunar rotation axis at t_{A11} is the following, with the approximation of a major standstill (29th March 1969):

$$e_\theta = (Cos\,(b)\,Cos\,(l)\,, Cos\,(b)\,Sin\,(l)\,, Sin\,(b)) \tag{5}$$

$$= (0.00, -0.0896766, 0.995971) \tag{6}$$

The ecliptic coordinates ($J2000.0$) of the lunar north pole at t_{A11} is the following, with the major standstill (29th March 1969) with an opposite tilt of the moon's orbital plane of $5.145°$ and with the constraint $e_r.e_\theta = 0$ is:

$$(l, b) = (-95°00', 90°00' - 05.145°) \tag{7}$$

The Cartesian unit vector of the lunar rotation axis at t_{A11} is the following, with the major standstill (29th March 1969) and the constraint $e_r.e_\theta = 0$:

$$e_\theta = (Cos\,(b)\,Cos\,(l)\,, Cos\,(b)\,Sin\,(l)\,, Sin\,(b)) \tag{8}$$

$$= (-0.00781583, -0.0893353, 0.995971) \tag{9}$$

The Cartesian unit vector e_ϕ at t_{A11} is:

$$e_\phi = e_r \times e_\theta = (-0.228451, 0.96982, 0.0851969) \tag{10}$$

The ecliptic coordinates ($J2000.0$) of the sun at t_{A11} is (Stellarium 0.18.0):

$$(l, b) = (118°41'30'', 00°) \tag{11}$$

The Cartesian unit vector of the sun position at t_{A11} is :

$$e_{sun} = (Cos\,(b)\,Cos\,(l)\,, Cos\,(b)\,Sin\,(l)\,, Cos\,(l)) \tag{12}$$

$$= (-0.480096, 0.877216, 0.00) \tag{13}$$

The lunar selenographic coordinates at the Apollo 11 lunar landing site (Tranquility base) is:

$$(\lambda_{A11}^{moon}, \beta_{A11}^{moon}) = (23°26', 00°41') \tag{14}$$

The Cartesian unit vector in the referential (e_r, e_θ, e_ϕ) pointing perpendicularly downward to the lunar surface of the the Apollo 11 lunar landing site (Tranquility base) is:

$$e_{A11}^{moon} = (Cos\,(-\beta_{A11}^{moon})\,Cos\,(-\lambda_{A11}^{moon})\,, Sin\,(-\beta_{A11}^{moon})\,, Cos\,(-\beta_{A11}^{moon})\,Sin\,(-\lambda_{A11}^{moon})) \tag{15}$$

$$= (0.917458, -0.0119261, -0.397653) \tag{16}$$

Remarks: the unit vector e_θ is upward and play the role of e'_z, the unit vector e_r is forward and play the role of e'_x, and the unit vector $-e_\phi$ is leftward and play the role of e'_y.

Figure 01 - Shadow of the upper left corner of the seismic experiement

The Cartesian unit vector pointing perpendicularly downward to the lunar surface at the Apollo 11 lunar landing site (Tranquility base) is the following, at the time t_{A11}:

$$e_{A11} = e^{moon}_{A11,1} e_r + e^{moon}_{A11,2} e_\theta + e^{moon}_{A11,3} e_\phi \tag{17}$$

$$= (-0.802229, -0.592707, -0.0716407) \tag{18}$$

The angle between the Cartesian unit vector pointing perpendicularly downward to the lunar surface of the the Apollo 11 lunar landing site (Tranquility base) and between the unit vector pointing toward the sun position is the following, at the time t_{A11}:

$$\theta_Z = ArcSin\left(||e_{sun} \times e_{A11}||\right) = 97.75^\circ \tag{19}$$

The solar altitude angle is the follwoing, at the Apollo 11 lunar landing site (Tranquility base) and at the time t_{A11}:

$$\alpha_Z = ArcSin\left(||e_{sun} \times e_{A11}||\right) - 90^\circ \tag{20}$$

$$= 07.75^\circ \tag{21}$$

$$Cot\left(\alpha_Z\right) = 7.35 \tag{22}$$

On the following NASA archive footage of the Apollo 11 mission, we can measure relatively precisely the cotangent of the solar altitude angle at the Apollo 11 lunar landing site (Tranquility base) and at the time t_{A11}:

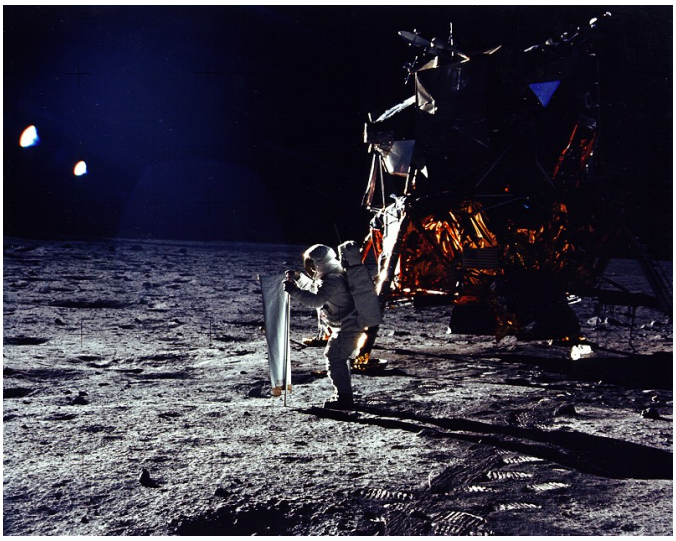

Figure 02 - Shadow of the left arm holding the solar wind experiment.

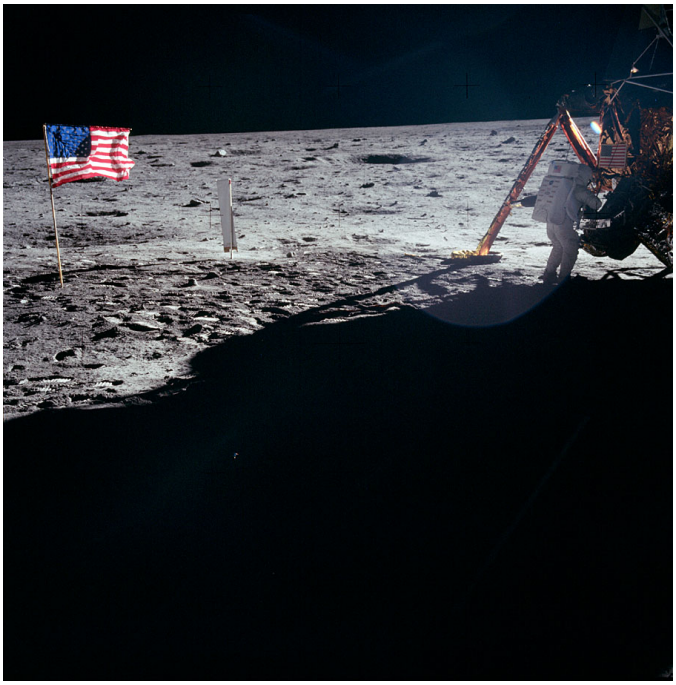

Figure 03 - Shadow of the top of the solar wind experiment.

$$Cot\left(\alpha_Z^{max}\right) = Cot\left(\alpha_Z + 2^\circ\right) = 5.82 \tag{23}$$

$$\alpha_Z^{max} = \alpha_Z + 2^\circ = 09.75^\circ \tag{24}$$

$$Cot\left(\alpha_Z^{NASA-Fig-01}\right) \cong 8.5/2.5 = 3.40 \tag{25}$$

$$\alpha_Z^{NASA-Fig-01} \cong ArcCot\left(8.5/2.5\right) = 16.3^\circ \tag{26}$$

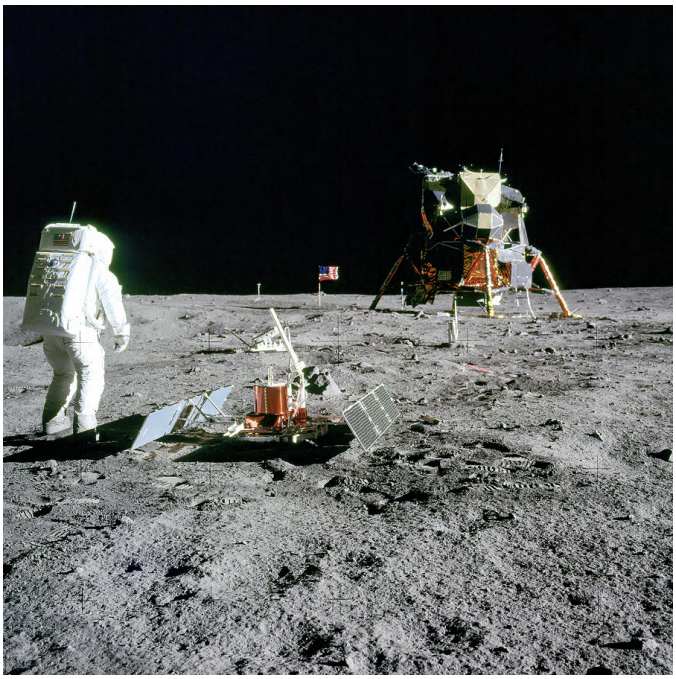

Figure 04 -Shadow of the upper left corner of the right photovoltaic panel of the solar wind experiment and self shadow of the upper right corner of the astronaut suit.

$$Cot\left(\alpha_Z^{NASA-Fig-02}\right) \cong 15.0/5.3 = 2.8 \tag{27}$$

$$\alpha_Z^{NASA-Fig-02} \cong ArcCot\,(15.0/5.3) = 19.4^\circ \tag{28}$$

$$Cot\left(\alpha_Z^{NASA-Fig-03}\right) \cong 7.75/2.8 = 2.7 \tag{29}$$

$$\alpha_Z^{NASA-Fig-03} \cong ArcCot\,(7.75/2.8) = 19.8^\circ \tag{30}$$

$$Cot\left(\alpha_Z^{NASA-Fig-04}\right) \cong 12.5/3.7 = 3.37 \tag{31}$$

$$\alpha_Z^{NASA-Fig-04} \cong ArcCot\,(12.5/3.7) = 16.4^\circ \tag{32}$$

$$Cot\left(\alpha_Z^{NASA-Fig-04-suit}\right) \cong Cot\,(16.2^\circ) = 3.44 \tag{33}$$

$$\alpha_Z^{NASA-Fig-04-suit} \cong ArcSin\,(1.75/6) - ArcSin\,(0.7/55) = 16.2^\circ \tag{34}$$

$$Cot\left(\alpha_Z^{NASA-Fig-05}\right) \cong 7.5 \times 20/3/(28 + 8.2/12 - 5 - 7.2/12) = 2.19 \tag{35}$$

$$\alpha_Z^{NASA-Fig-05} \cong ArcCot\,(2.17) = 24.5^\circ \tag{36}$$

Remarks: α_Z^{max} is the solar altitude angle with respect to ground with a maximal slope of 2°. From the NASA archive footage, the most precise value for the solar altitude angle should be $\alpha_Z^{NASA-Fig-05}$ with the shadow of the whole Lunar Module from the preliminary map of EVA photographs and television pictures.

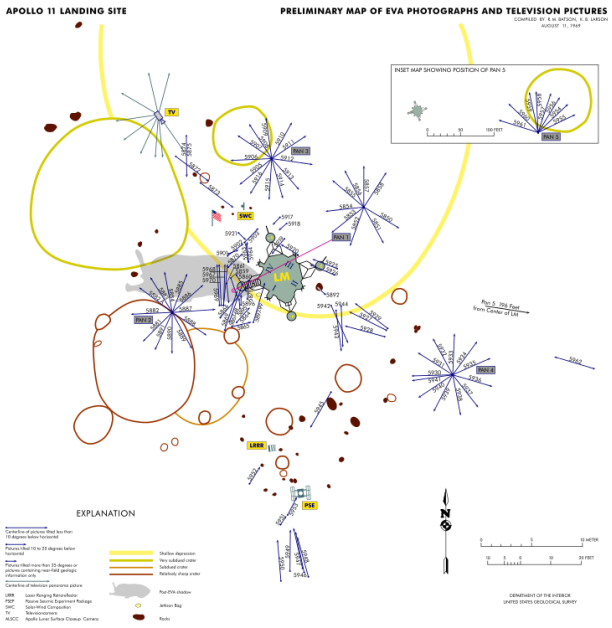

Figure 05 - Shadow of the whole Lunar Module from the top of the rendezvous radar antenna to the top of the foot pad.

The single consecutive period is the following, when both astronauts of the Apollo 11 missions are outside the Lunar Module at the lunar landing site (Tranquility base):

$$\Delta_T = 111 + 39/60 - 109 - 42/60 - 20/60 = 1.62\ hr \tag{37}$$

The solar angle variation in the lunar sky is the following, when both astronauts of the Apollo 11 missions are outside the Lunar Module at the lunar landing site (Tranquility base):

$$\Delta_\theta^{sun} = \Delta_T / T_{moon}^{sideral} \times 360^\circ = 1.61667/27.322/24 \times 360 = 0.888^\circ \tag{38}$$

The official ending time of the Apollo 11 EVA is:

$$t_{A11} = 1969 - 07 - 16\ 13:32:00\ UTC + 111\ hr + 39\ min \tag{39}$$

$$= 1969 - 07 - 21\ 05:11:00\ UTC \tag{40}$$

The official starting time of the Apollo 11 EVA is:

$$t_{A11} = 1969 - 07 - 16\ 13:32:00\ UTC + 109\ hr + 42\ min \tag{41}$$

$$= 1969 - 07 - 21\ 03:14:00\ UTC \tag{42}$$

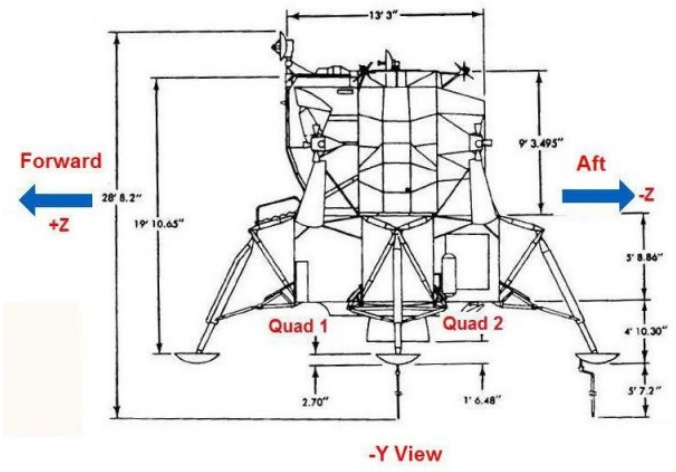

Figure 05 - Shadow of the whole Lunar Module from the top of the rendezvous radar antenna to the top of the foot pad.

In conclusion, the Apollo 11 cheaters have probably been reckless about the exact position of the sun in the lunar sky at the lunar landing site (Tranquility base) during the Apollo 11 EVA. Indeed, that precision for the sun position would be much less meaningful on Earth with a usual ground much less flat and a sun rotating much faster in the Earth sky. Moreover, the smaller solar altitude angle, the larger absolute precision of the solar altitude angle is reached by the shadow measurements on a horizontal surface. The result of that recklessness: all the shadows on the NASA archive footage of the Apollo 11 EVA are more than 41% too small with a too large discrepancy between them.

Annexes

Hints to conjecture the complete solution of the Apollo Conspiracy:

1. Nine American astronauts officially died before 1968. Those deaths are fake and these nine American astronauts are kept alive in secret US government buildings.

2. The Apollo 4 mission sends few nuclear missiles into high Earth orbit in response to the Cuban crisis less than 5 years earlier.

3. The Apollo 6 mission sends few nuclear missiles into high Earth orbit in response to the Cuban crisis less than 5.5 years earlier.

4. The Apollo 8 mission sends 3 American astronauts into low Earth orbit and a few nuclear missiles into lunar orbit in response to the Cuban crisis 6 years earlier.

5. The Apollo 10 mission sends 3 American astronauts into low Earth orbit and a few nuclear missiles into lunar orbit in response to the Cuban crisis 6.5 years earlier.

6. The Apollo 11 mission sends 3 American astronauts into low Earth orbit and a few nuclear missiles into lunar orbit in response to the Cuban crisis 6.5 years earlier. The videos and the photos taken on the lunar surface are all fake.

7. The Apollo 12 mission sends 3 American astronauts into low Earth orbit and a few nuclear missiles into lunar orbit in response to the Cuban crisis 7 years earlier. The videos and the photos taken on the lunar surface are all fake.

8. The Apollo 13 mission sends 3 American astronauts to low earth orbit and 2-3 secret kamikaze astronauts to the lunar surface without a return flight. The videos and the photos taken on the lunar surface are used for Apollo 14. Archive footage right after returning to Earth show much more happiness just after the Apollo 13 mission than just after the Apollo 11 mission. It could be explained by the following fact: the Apollo 13 mission has provided the first real videos and the first real photos of the American astronauts taken on the lunar surface (from 2-3 secret kamikaze astronauts).

9. The Apollo 14 mission sends 3 American astronauts to low earth orbit and 2-3 secret kamikaze astronauts to the lunar surface without a return flight. The videos and the photos taken on the lunar surface are used for Apollo 15.

10. The Apollo 15 mission sends 3 American astronauts to low earth orbit and 2-3 secret kamikaze astronauts to the lunar surface without a return flight. The videos and the photos taken on the lunar surface are used for Apollo 16.

11. The Apollo 16 mission sends 3 American astronauts into low Earth orbit and a few nuclear missiles into lunar orbit in response to growing Cold War paranoia.

12. The Apollo 17 mission sends 3 American astronauts into low Earth orbit and a few nuclear missiles into lunar orbit in response to growing Cold War paranoia. The videos and the photos taken on the lunar surface are a fake compilation of the previous videos and the previous photos taken on the lunar surface.

No one came back alive from the moon. No one alive has re-entered the Earth's atmosphere at 11.0 km/s. All shadows on NASA archive footage of the Apollo 11 EVA (extravehicular activity) are more than 41% too small. It explains why USA and USSR has exchanged only 3 grams of lunar samples. It explains also the official very strange static accident of Apollo 1 where three American astronauts were simultaneously vaporized by a fire on the Earth ground in 1967. Laika, the Soviet space dog, and the Japanese kamikaze pilots greatly "inspired" the US government. Finally, the US government was very worry that USSR were the first to sent an animal alive on the lunar surface.

This scenario is consistent with the following facts: a whole secret American city has conspired secretly during two years in order to kill by surprise 200 000 Japanese civilians in 1945 with two nuclear weapons and without being detected by the Japanese spies. The return flight ticket from the moon would require a rocket 3x to 5x times larger and it would cost hundred of billions of dollars more. By far, that cost is much more than the life of three very average/typical military men who strangely disappeared with the Apollo 1 mission (the value of their life is about 30-60 million dollars according to the US Government Federal Agencies). Finally, a Greek god name like Apollo is well appropriate for these modern human sacrifices (secret kamikaze astronauts) and the artificial suns into lunar orbits (nuclear missiles into lunar orbit carrying hydrogen bombs).

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