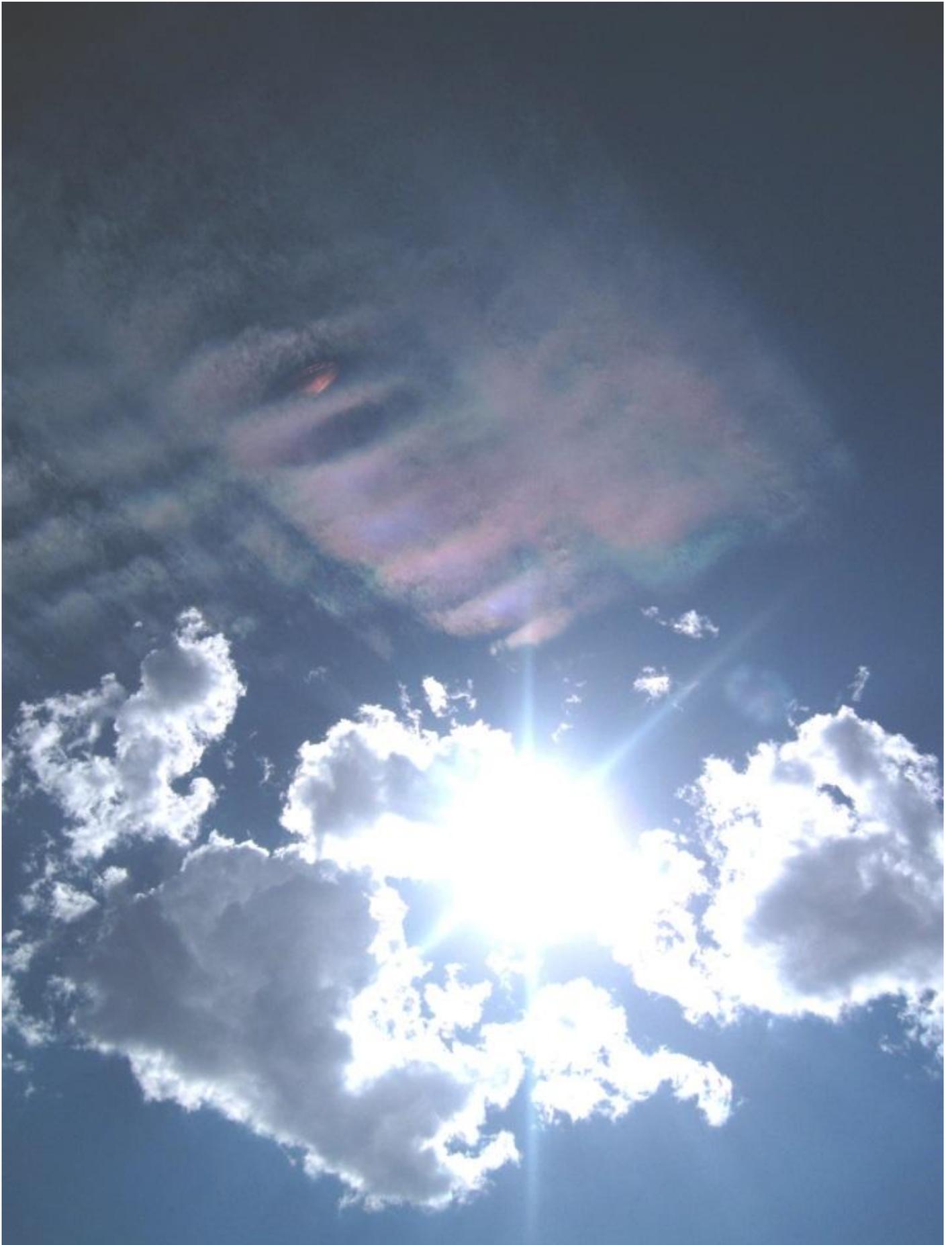


IPACO expert report

<i>Expert name</i> Antoine COUSYN	<i>Report date</i> October 22, 2014	<i>Last update</i>	
<i>Type</i> IFO	<i>Class</i> A	<i>Explanation</i> Object reflection in a car windshield	<i>Complement</i>
<i>Document</i> Photographic	<i>Imaging location</i> El Yeso, Chile	<i>Imaging date</i> February 14, 2010, 17:17:10	



Close-up of the UAP extracted from the full-frame photo below



Photograph n°4680937238_51527f2166_0.jpg extracted from the complete sequence (see source 1)

I. Imaging circumstances

1. Introduction, presentation of the case and hypothesis

Mr., Mrs. X. and their daughter were driving on a gravel road in the Andes Mountains near the El Yeso reservoir (Chile) for a Sunday picnic, on February 14, 2010 around 5pm. Mrs. X. took five photographs of the bright blue sky, four with no visible UAP (Fig 1.1 below) and the last with the UAP.

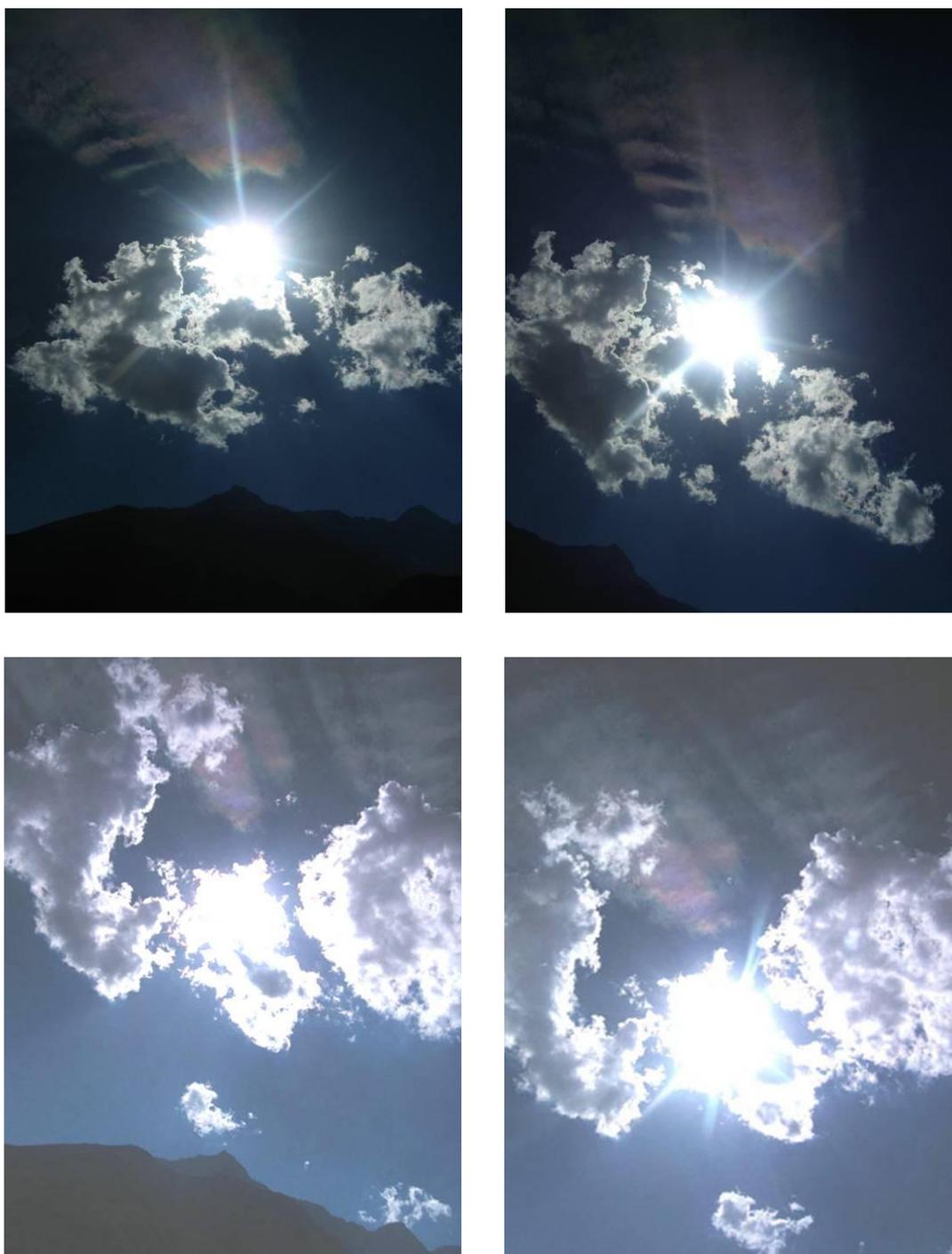


Fig. 1.1 – the four first images from the sequence

It is assumed that Mrs. X took the photographic sequence from the passenger seat of the car, and through the windshield, with the camera aimed vertically. It is not known whether the car was still going along the road, but this detail has no importance for the following analysis.

The car was a 2008 Chrysler Dodge Grand Caravan and was located on a gravel road, at an altitude of 2600 m, and at the following coordinates: 33°47'8''S; 69°53'35''W, moving toward the south-west.



A close inspection of some inside views of the car model reveals some interesting details:

- The gearshift is located on the dashboard, close to the windshield:



- A closer view on this gearshift allows us to notice the presence of regular seams. The disposition and number of these seams seems similar to that that can be seen on the "UAP":



Then there is strong suspicion of the solar reflection of this gearshift in the windshield.

The question is: *"Is there a possible geometry that can summarize all the known data?"*

2. Analysis

The required data to proceed to the analysis are:

- Windshield angle
- Car position
- Road slope
- Angle measurements on the photograph
- Sun elevation in the sky

- Windshield angle:

This data can be obtained by simply measuring this angle on a side view of the car:



The windshield angle to the horizontal is **approximately 34°**.

- Car position

The position of the witness is not known with certainty. We can however rely on simplified coordinates, such as **33°37'00 S; 70°00'00 W and an altitude of 2600 m above sea level**. Some small differences will not drastically change the results obtained from this data, i-e the sun position.

- Road slope:

As stated above, the exact position of the witnesses on the gravel road is not known with certainty; however we do know the road portion they were on. So, using Google Earth and the elevation profile module, we can have a good idea of the road mean slope:



The gravel road length between the beginnings of its south-west orientation up to its proximity to the El Yeso reservoir is approximately 7 km.

The altitude varies during this distance from a minimum of 2585 m to a maximum of 2656 m, with a mean slope of -3.9%. Except on rare occasions, this slope is never greater than 5/6% and mainly between 0 and 4%. This small angle will not change in a significant way the results.

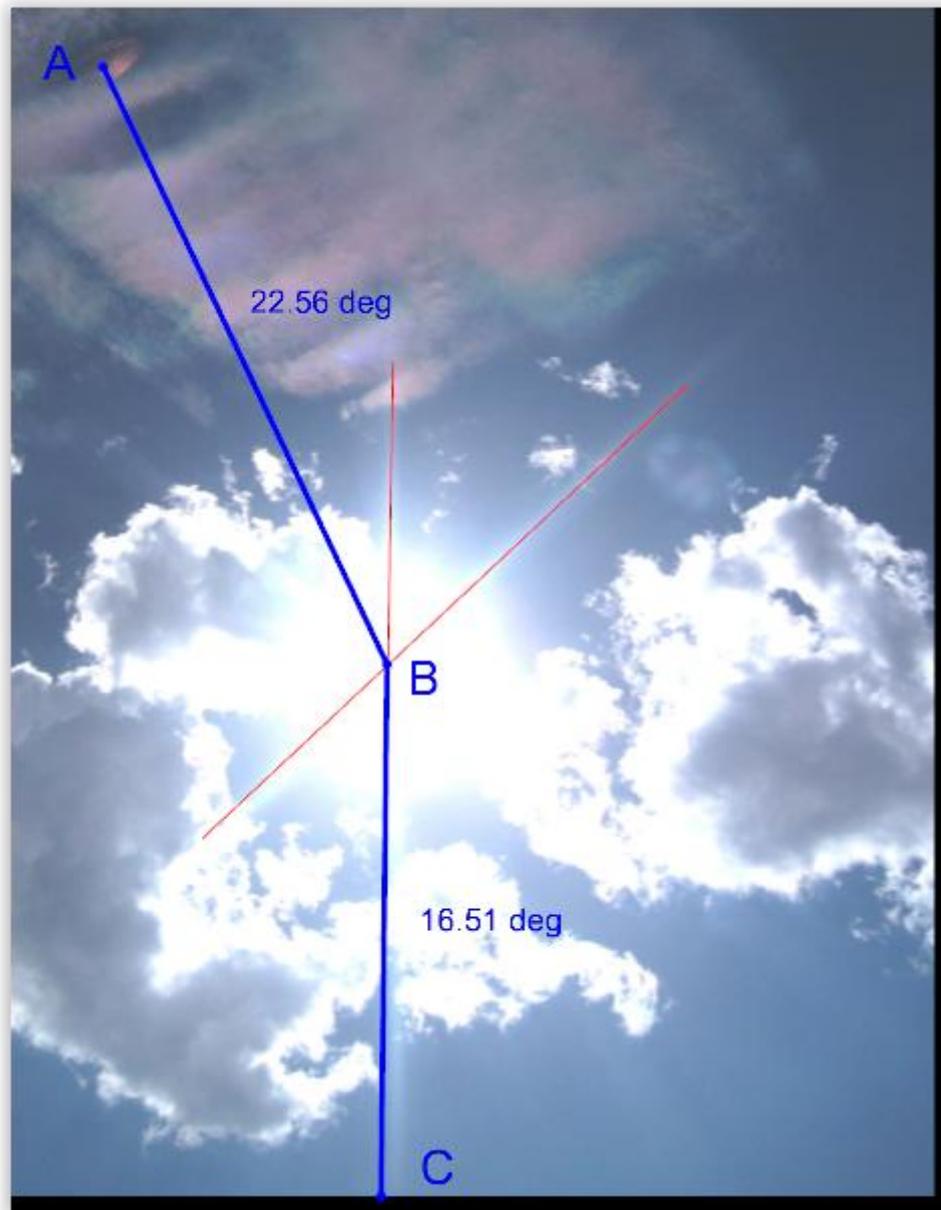
We will consider then, for future computations, the value of 0° .

- Angles measurements on the photograph

For the analysis there are two important data that need to be determined:

- The angular distance between the UAP ("A") and the Sun ("B") and
- The vertical angular distance between the Sun and the bottom of the photograph ("C")

In order to do so, we open the photograph with IPACO and measure with the "angle" tool these two criteria:



The results are then:

- **Angle length between the UAP ("A") and the Sun ("B"): 22.6°**
- **Vertical angle length between the Sun and the bottom of the photograph ("C"): 16.5°**

- Sun elevation in the sky

Using the [NOAA Solar Calculator](#), the local time of the photograph given by the EXIF data (17:17 pm) and the above determined coordinates, we can drive the elevation of the sun, which is **39.6°**:

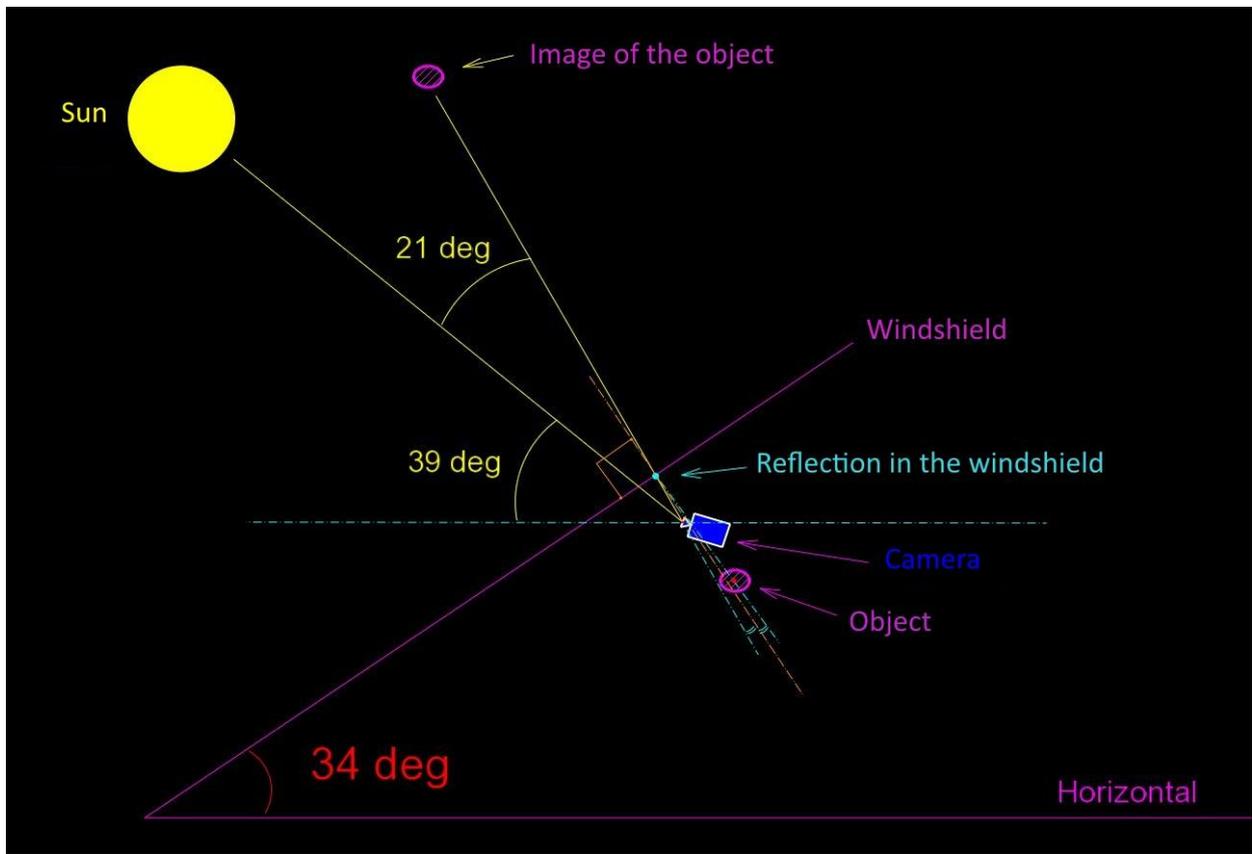
Location: Lat Lng Time Zone DST? Save

Date: Day Mon Feb Yr Local Time: : : PM

Equation of Time (minutes):	Solar Declination (in °):	Apparent Sunrise:	Solar Noon:	Apparent Sunset:	Az/EI (in °) at Local Time:
-14.18	-12.84	07:15	13:54:11	20:33	281.74 39.61
Show on map:		Sunrise <input type="checkbox"/>		Sunset <input type="checkbox"/>	Azimuth <input type="checkbox"/>

All these data can be now summarized in the following sketch that reconstruct the trajectory of the sunlight passing through the windshield and that captures the image of the object inside the car that stands on the windshield.

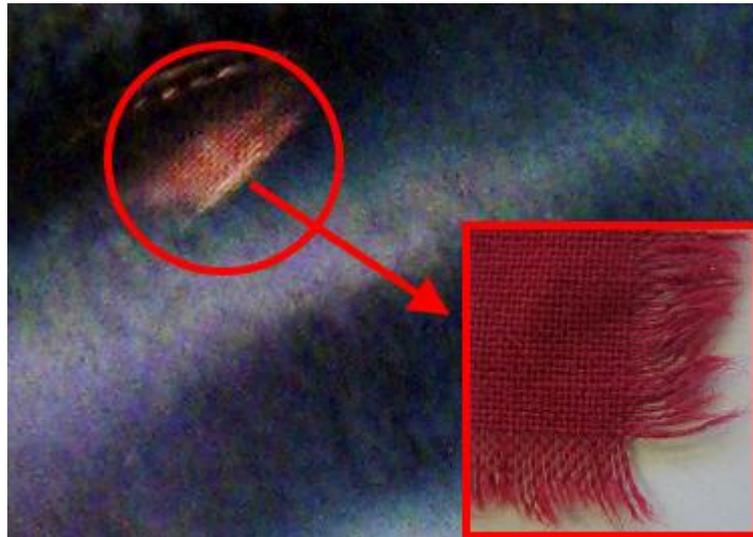
It was done considering that the road slope angle is 0°.



Regarding the nature of the object that could produce this reflection, it is apparent that the disposition and number of visible seams of the gearshift is very similar to that which is seen in the image of the apparent UAP:



However, if we look closely at the structure of the UAP, what looks like the weave of the weft and warp threads of a textile appears:



This structure appears nowhere in the photograph, so we can say that it probably belongs to the object itself. It could be an item of clothing, a textile bag, a plaid... located close to the dashboard.

II. Conclusion

We strongly suspect that the apparent UAP is very likely to have been just the reflection of an object located inside the car, lit up by the sunlight and that reflects in the windshield. This object is possibly the gearshift or another textile object that stands close to the dashboard.

The geometrical/optical reconstruction confirms that theory and reminds us once again that a photograph taken with a strong light source in the field of view is likely to generate undesired artifacts.

III. Sources – Photos credits – Acknowledgments

- Richard F. Haines: *“Photoanalyses of Digital Images Taken on February 14,2010 at 1717 Hours above the Andes Moutains in Central Chile”* – July 2, 2010
- Milton W. Hourcade – UAPSG-GEFAI – International Coordinator