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Preliminary Analysis of the Ceremonia Magna Video UAP of September 13, 2012 at Mexico City, Mexico[1]

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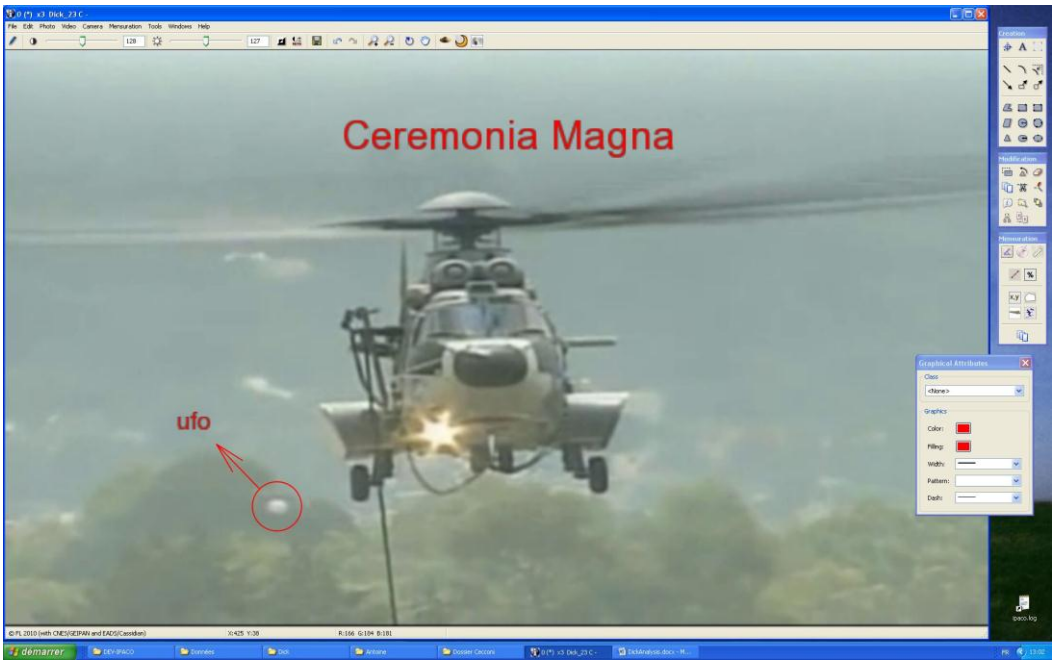
Introduction

A video was taken by the Mexican military authorities during their "Ceremonia Magna: Pensamientos de la Patria" celebration on September 13, 2012". A short sequence of this official video[3] document that begins at about 1:53:51 elapsed time shows a small white unidentified aerial phenomena (uap) crossing the scene from the right to the left, almost horizontally. It is circled in red (from one of the frames) in Figure 1.

Figure 1

Frame from Video Showing the UAP



1. This spectacular ceremony to commemorate the 202nd anniversary of the independence of Mexico was recorded by official photographers and videographers as well as by private citizens.
2. Dr. Louange has kindly permitted this research article to be published here to illustrate some of the useful insights that can be gained from the use of advanced image analysis software that he has developed. He is an independent consultant in France. (www.ipaco.fr)
3. Two of the full length youtube videos are found at: www.youtube.com/watch?v=kxmPvd8yVrE and www.youtube.com/watch?v=2kLK6bycwN8 Both last for 2 hours, 29 minutes, 7 seconds.

Important note: *This preliminary analysis concerns exclusively the video document (referenced in FN 3), without any further knowledge about the case, nor any access to other possible existing data. It was carried out using an array of specially developed IPACO software tools. (www.ipaco.fr)*

Available document

The video file provided for analysis by NARCAP-USA is in *wmv* format. Several frames are identical, which probably reflects a previous file conversion.

The video sequence during which the uap appears has the following characteristics:

- Duration : 3.533 sec.
- Number of frames : 54

Corresponding to (54-1)/3.533 = 15 frames/sec.

In fact, only 36 different images (frames) could be extracted from that video sequence (2/3). Those are numbered from 1 to 36 in the following analysis.

Trajectory of the "uap"

A plot has been produced to show the apparent trajectory of the uap across the screen: the 36 different positions of the object are plotted in red in Figure 2 (displayed upon frame n^{o} 23.) In the same way, the apparent trajectory on the screen of the helicopter's light is plotted in green.

Figure 2

Apparent Trajectory of UAP Relative to the Helicopter

The apparent curvature of the uap's trajectory, which seems to move upwards on the left side of this picture, is nearly cancelled if we subtract the effect of the helicopter light's apparent trajectory; it is simply induced by the operator's movements (during the 3.5 sec. sequence, the helicopter remains practically motionless, i.e. part of the static landscape). The real trajectory of the uap is therefore nearly horizontal.

The apparent unevenness of the uap's velocity (uneven distances between consecutive plotted "red" positions) is certainly due to the same technical reason for which only 2/3 of the 54 frames are different: frame resampling during a file conversion.

The most significant detail in the uap's trajectory is when it passes the vertical rope hanging down from the helicopter (Frames 18 and 19). This is considered below.

Size and distance

As is usual in such cases, the main problem is to evaluate the size of the imaged object or phenomenon, as well as its distance from the camera. Unfortunately, at this stage, the usual software tools are not usable, since neither the focal length nor the sensor's size is available.[4] As concerns the uap's distance from the camera, the only certainty, at this point, is that it is nearer than the distance to the trees seen in the background and which appear in the uap's line of sight along this video sequence.

A crucial question, in order to try and reduce the possible distance range, is to determine whether the uap passed behind the rope or in front of it.

UAP vs rope

On frames 18 and 19, the uap's line of sight crosses the rope's line of sight. At the intersection, although the uap is very light, the dark rope is still apparent, as illustrated by the 2 following radiometric cross-section plots, (Figure 3 and 4) respectively, across and along the rope (Frame 18).

4. With such data, a ratio could have been established between size and distance, as well as between speed and distance.

Figure 3

Radiometric Cross-section Plotted *Across* the Rope (Frame 18)

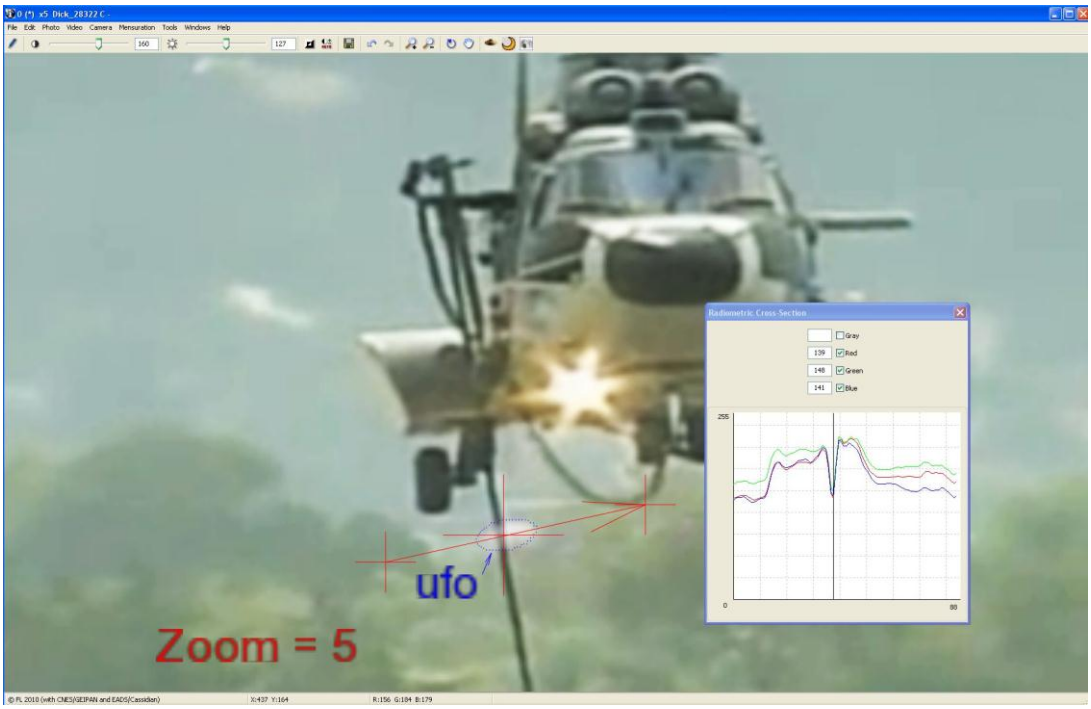
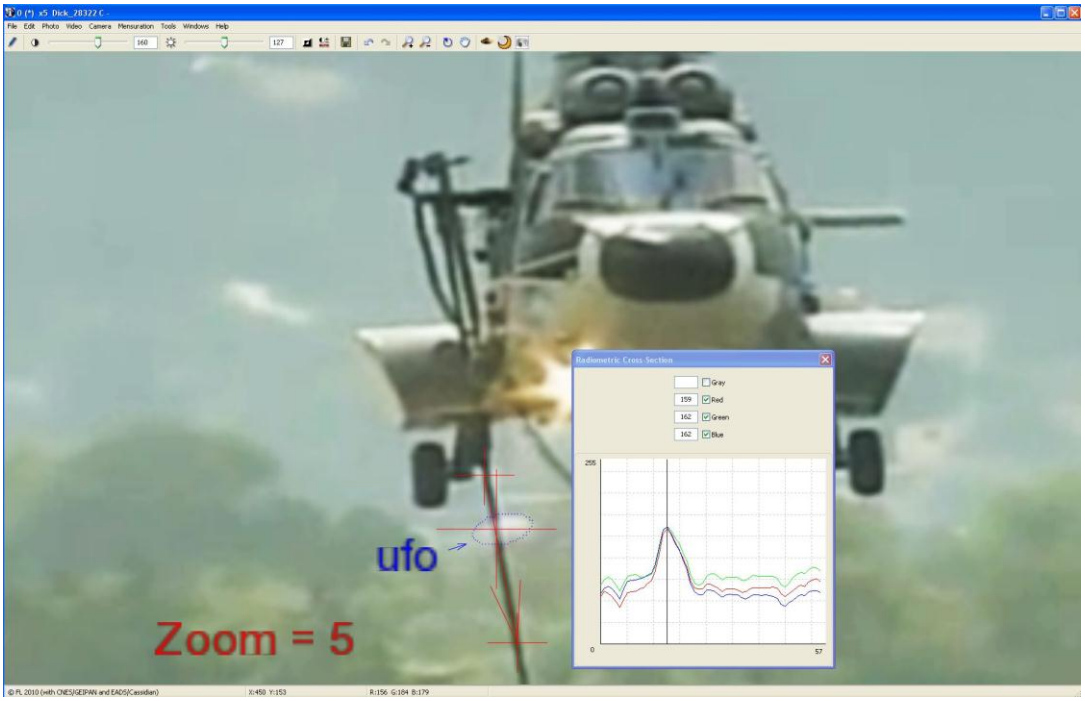


Figure 4

Radiometric Cross-section Plotted *Along* the Rope (Frame 18)



If we assume the uap is an opaque object, those plots clearly show that it passes behind the rope: otherwise, there would not be any drop in luminance as it would have passed in front of the rope.

But if, on the contrary, we assume it is somewhat transparent (cloud, smoke), the question remains open.

Opacity/ transparency of the uap

In order to establish whether the uap is transparent or not, we can check, along its observed trajectory, whether its luminance level is influenced by the background (which varies notably, from the clear sky to more or less dark trees).[5]

Using the 36 ellipses that circumscribe the uap's position, respectively, on the 36 frames, we measure 2 parameters related to each position:

- Maximum gray value (lightest pixel) of the uap, measured on the concerned frame.
- Mean gray value in the same ellipse, when the uap is not present, measured on a neighbor frame.

If the uap is significantly transparent, its luminance level should somewhat follow the variations of the landscape behind it, since in that case, the observed luminance would be the addition of the uap's own light plus part of the landscape's light.

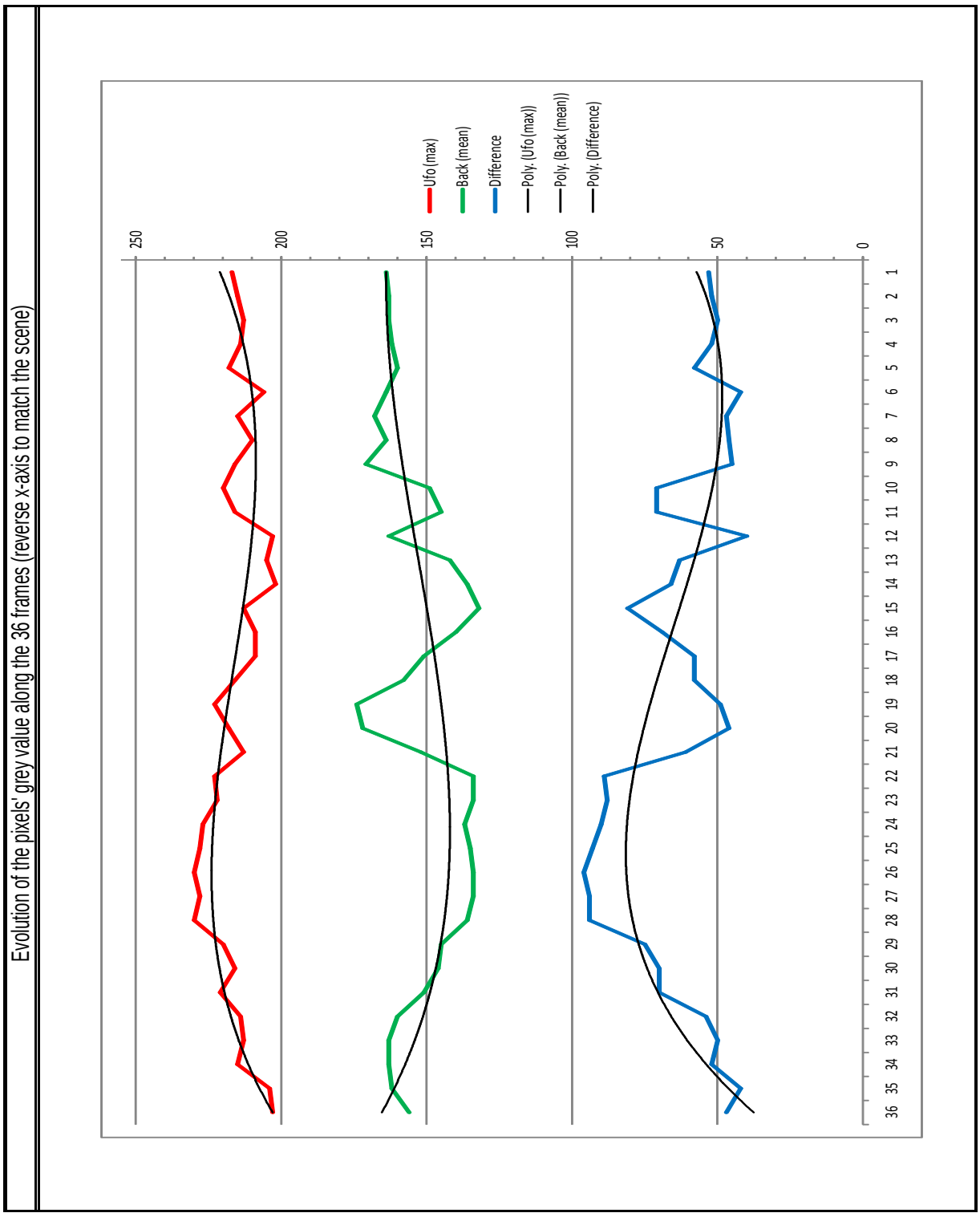
The results of this measurement are shown in the following data curves of Figure 5, along the 36 frames concerned (X axis):

- In red : UAP's maximum luminance (right to left)
  Plus polynomial trend curve (3rd degree)
- In green :Corresponding background's mean luminance
  Plus polynomial trend curve (3rd degree)
- In blue: Difference between red and green curves
  Plus polynomial trend curve (3rd degree)

5. This is a good illustration of the value in such analyses of having the uap imaged against a known, stable, opaque background. (Ed.)

Figure 5

UAP Transparency Values in Red, Green, and Blue
(See text for explanation)



Visual examination of those plots brings out the absence of significant "correlation" between uap's luminance variations and background's luminance corresponding variations.

This empirical approach indicates that the uap is certainly either opaque, or not transparent enough to let the rope appear as clearly as it does, if it had passed in front of it.

Therefore, the uap certainly passes behind the rope.

In (provisional) conclusion, at this point, we know that its distance from the camera is comprised between the trees' distance from the camera and the rope's distance from the camera.

Possible further analyses

In order to be in a position to establish:

- A ratio between size and distance of the uap
- A ratio between speed and distance of the uap,

it would be required to have access to one of the two following sets of parameters:[6]

EITHER

- Camera's focal length
  and
- Camera's sensor physical dimensions,

OR

- The helicopter's width
  and
- The helicopter's distance from the camera.

6. While the model and dimensions of the helicopter were subsequently discovered NARCAP could not obtain the other details needed. (Ed.)

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