

Rubén Lianza Sky Lantern Hypotheses Rebuttal
By SCU
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Overview This report is a response by the Scientific Coalition for Ufology (SCU) to the report written by Rubén Lianza and posted on the IPACO website: http://www.ipaco.fr/EN_IFO_B_heart_130425.pdf The Lianza paper argues that the unknown object in the 2013 Aguadilla, IR video is two Chinese Lanterns, party lanterns, etc., that are tied together. The SCU has read the paper carefully and reject this possibility for several reasons. First, in order to match the lines-of-sight between the camera and the object, any wind born object must travel a minimum of 16mph and this is too high a wind for a lantern to remain airborne. Second, the lantern theory does not explain the disappearance of the object behind trees and most importantly into the water. Third, the lanterns would have shown up as two separate objects early on in the video and this is not the case. Lastly, the lantern theory assumption that a few ideal frames can be selected to do detailed and specific measurements is examined.

Analysis of Chinese Lantern Theory Mr. Lianza's report is not an analysis of the video. An analysis of the video would begin with the initial facts shown in the video and proceed step by step to determine all of the various information that can be gleaned from the video. The report does not discuss the radar data that showed a definite unknown to the northwest of the airport prior to the aircraft's departure, it does not discuss that the pilot saw the object to the northwest over the ocean at an elevation above his aircraft and moving to the south, it does not look at the angular sizes of the object throughout the three minute video, nor does the report examine in detail the IR signature of the object throughout the three minutes of the video. There is no analysis as to whether this theory would match up with the lines of sight of the aircraft's camera. Instead the report draws a conclusion first, that the object is a Chinese Lantern, and then jumps to the parts of the video that can be used to establish this case. This is not the best way to approach an analysis of the video.

Nonetheless, we will look at Mr. Lianza's report. In the first half of the second page he spends several paragraphs indicating that he is not prejudiced in his analysis of the video yet even before we leave the second page of Mr. Lianza's report he has already made the statement, "Fernandez properly debunked statements by Powell et al about the UFO deliberately changing directions." All that we know of Gilles Fernandez is that he is a psychologist who runs a blog that debunks UFO reports. We have seen no report from him that analyzed this video. We are unfamiliar with the name Andres Duarte and do not know what he has written. Mr. Lianza quotes from an email that was written by Duarte unknown to us but apparently it has already convinced Mr. Lianza that the video is of a Chinese Lantern. If there is a report completed by either Duarte or Fernandez, the SCU would be appreciative if a copy could be provided. Robert Powell personally contacted Bob Bixler and requested that he analyze the SCU report. Bob Bixler did put together a report which concentrated on a specific portion of the video. Robert Powell indicated to Bob that his calculations of angular size would have been very different if he had used the angular size of the object in just a few frames prior to when he measured the object as it passed in front of the market. Bob's report does not explain the full movement of the object were it a balloon, nor does it explain the IR signatures that are seen, and there is not a good explanation in the Bixler report for when the object disappears behind the tree and when it impacts the water. A specific review of Bob Bixler's report will be done in the near future.

In page 3 of his report, Lianza makes the claim based on 'his experience' that it is nearly impossible for a cameraman to film an object at night and it risks a mid-air collision. There is no risk of a mid-air collision because the IR camera is being operated by a technician in the aircraft, not the pilot. Furthermore, the ability to video an object is dependent on the speed of the filming aircraft, the speed of the object being filmed, the distance between the two objects, and their angular movement between each other. So Lianza's experience is not relative unless he demonstrates information related to the four parameters just cited as it relates to this specific video. For example, traveling in an aircraft at 250 mph while looking at an object moving at 80 mph at 3 nautical miles results in an angular movement of .8 degrees to 1.5 degrees per second depending on whether the two objects are moving towards each other, away from each other, or some distance or angle in between. It is not difficult for a technician in an observational aircraft to move his camera at a rate of 1.5 degrees per second or less. You can verify this yourself with a simple experiment. A typical Boeing 737 that is flown by many airlines is about 120 feet long and when taking off must not exceed 280 mph prior to clearing 10,000 feet. At this altitude the Boeing 737 takes up almost .7 degrees of space in the sky or a little less than twice the diameter of the full moon. As it is moving across the sky it is doing so at a rate of about 2.3 degrees per second, which means it will move from an overhead position to just over the horizon in about 40 seconds. This is a much faster rate than the angular rate of the plane and object in the Aguadilla video. So take out your video camera and test the difficulty of following an aircraft at this speed and distance. You should not have any problem maintaining the plane in your camera.

In page 4 of his report, Lianza talks about the difficulty measuring the various vectors involved in calculating the speed of the object due to the parallax and unknown reference points. He uses ice skaters and a camera as an

example. This is true, which is precisely why in the report that we only measured speed when we were confident of the location of the object. In the SCU report we calculated speed only at points in the video when the object either moved behind another object (in Lianza's example, the skaters would have moved behind the white poles) or at the times when the object entered the water. Now we can argue the point of whether the object moved behind the tree or whether the object impacted the water, but for Lianza to argue about parallax issues is not relevant in this video. If the object impacted the water or if the object moved behind the trees then the balloon argument is no longer valid. Period. This is the crux of the case because it allows for the calculation of distance and speed. An examination of all of the frames of the video shows that the only time the IR signal of the object is completely gone is when the object travels behind the tree, some frames after passing by the tree, and when it goes into the water. Figure 1 shows a sequence of frames when the object moves behind the tree. The IR signal is completely lost in Image 2705 and that lost is abrupt. The time from a strong signal in image 2697 to zero signal in image 2705 is only 1/4 of a second.

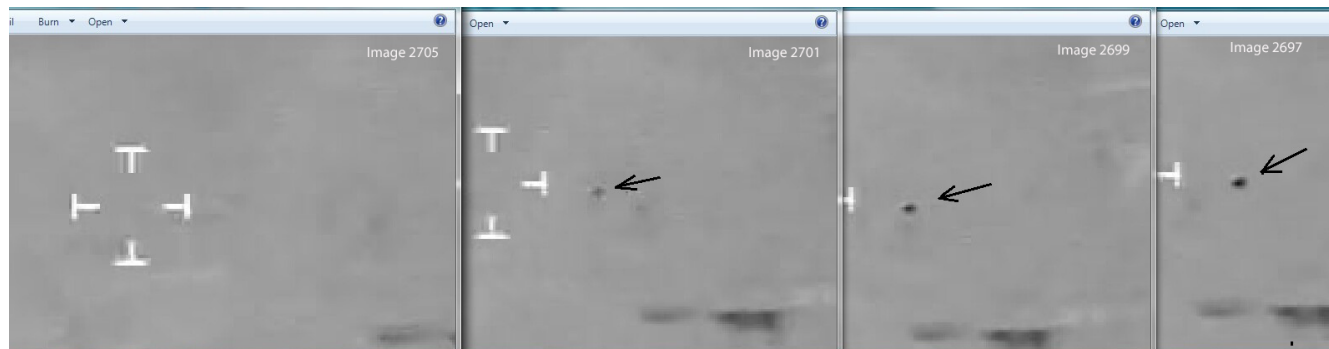


Figure 1

Figures 2 and 3 also establish that the entry of the object into the water is not a result of clouds between the camera and object, or a malfunction of the camera system, or a loss of clarity in the camera image. Figures 2 and 3 show histograms of the IR pixel distribution just before the object enters the water and then 1/3 of a second later. The drastic changes in the pixel distributions only affects the object and not the surrounding water. This argues strongly against there being a cloud, a camera failure, etc., because a cloud cannot selectively block the pixels making up the unknown while not affecting the pixels making up the water; nor can a camera's signal variability only be unique to the object while the water's IR signal goes unaffected. These histograms establish that the loss of imagery of the unknown object in the video was unique to that object. The object does enter the water.

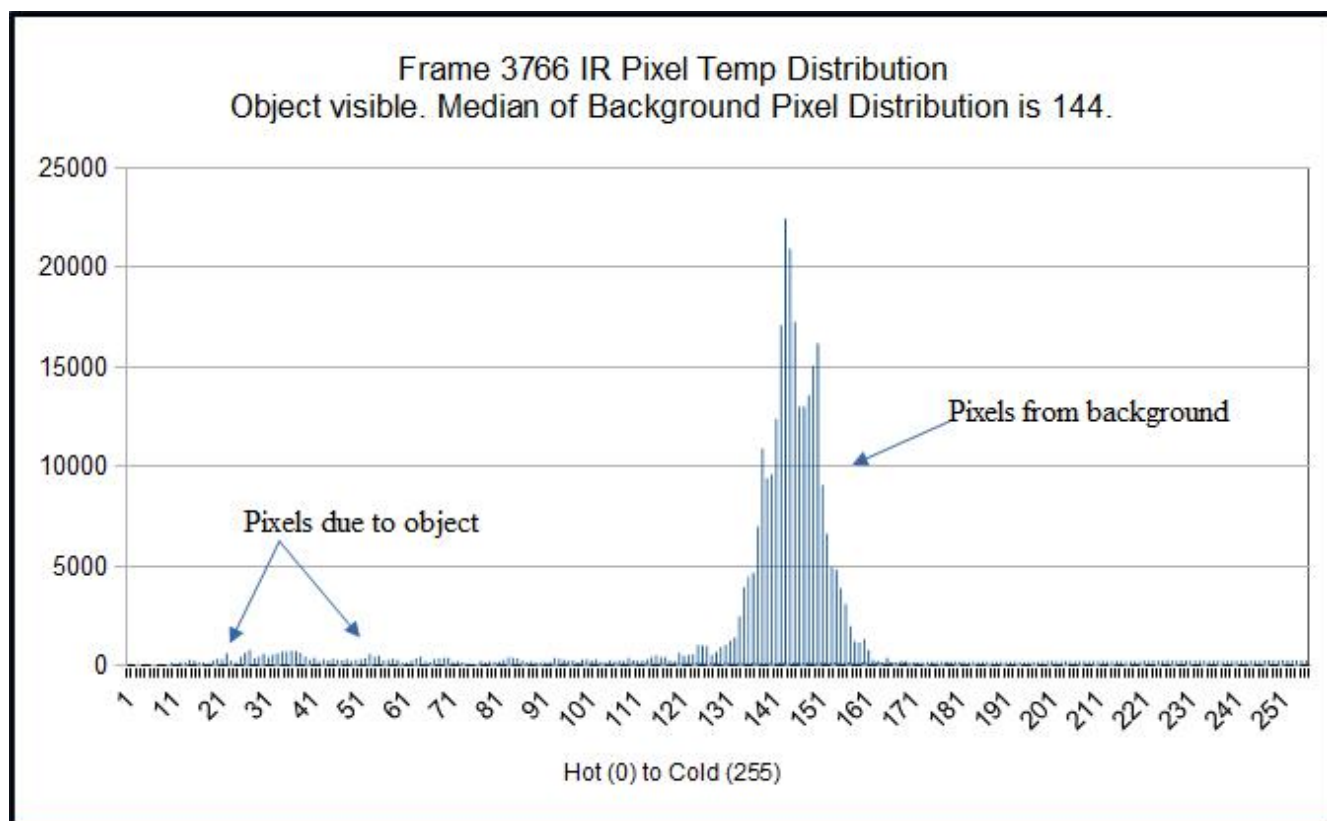


Figure 2

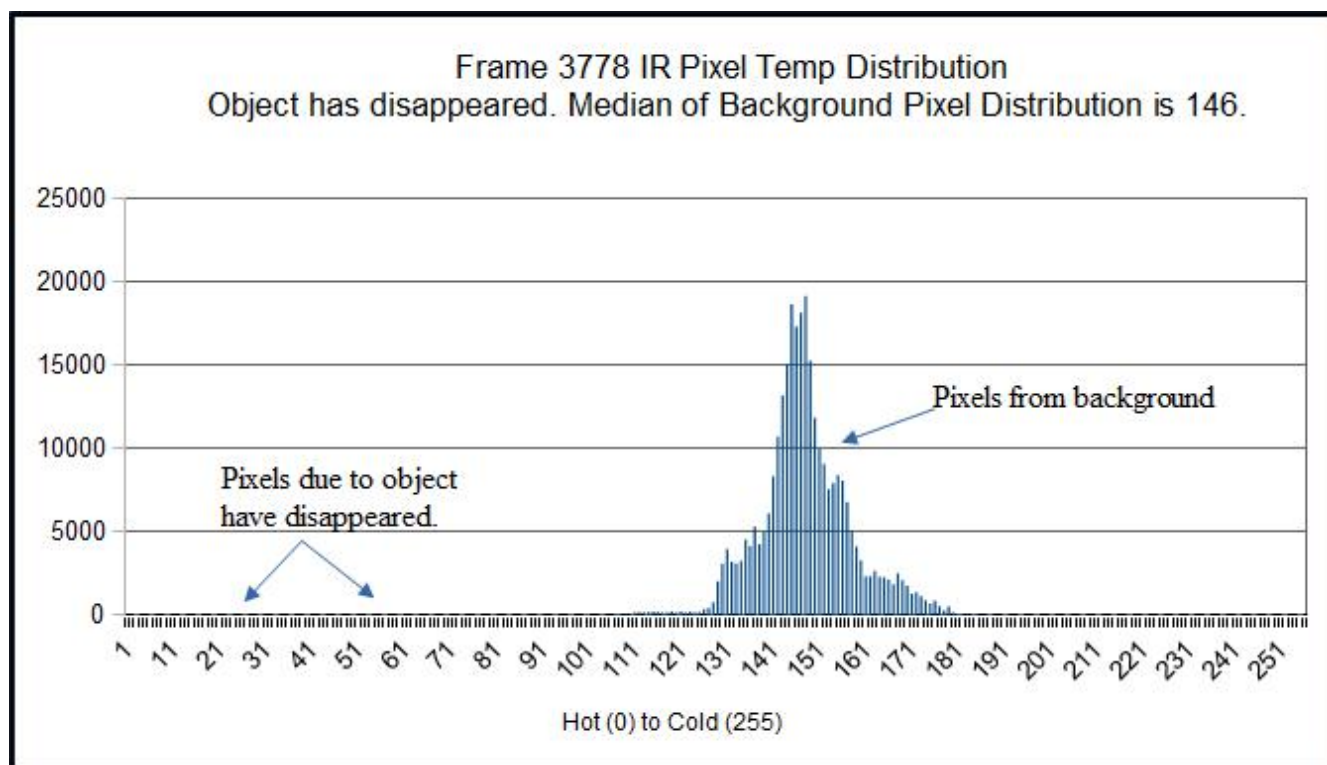


Figure 3

Lianza uses pages 5-10 of his report to discuss his theory of a pair of Chinese lanterns tied together as the solution to what is seen in the video. The theory of a Chinese lantern does help avoid the issue that a regular balloon cannot match the IR signature of the object in the video and Lianza posits that there are two lanterns tied together so as to explain the splitting of the object towards the end of the video. His wording is bolded and he states, "...each one of them is unmistakably manufactured in the shape of a heart." I would urge the reader to look at Lianza's report for themselves and make a determination if the two objects look like a heart. What the author has done is similar to seeing objects in clouds or pareidolia. There are a couple of major hurdles to overcome with trying to explain the object in the video as a pair of Chinese lanterns tied together.

The first issue that prevents a Chinese lantern from being a possible explanation involves the speed of the lantern in the wind. Lianza indicates the wind is blowing at 7 knots (8 mph) out of the ENE. This fact is not in dispute and it is mentioned in the SCU report as the wind ground speeds varied from 8-13 mph and the upper air wind speeds at 400 to 3200 feet were higher at 12-18 mph. There are two limiting factors regarding the speed of a Chinese lantern in the wind that prevents this theory from fitting the facts provided in the video. Chinese lanterns have difficulty remaining airborne in winds above 5 mph because the sides collapse pushing the warm air outwards and causing the lanterns to crash. The delicacy of these lanterns can be seen on page 9 of Lianza's report. This is mentioned at several sites that sell Chinese lanterns with a recommendation to not release them in winds with speeds above five mph: <https://www.skylanterns.us/Sky-Lantern-Safety-and-Usage-s/83.htm> and <https://www.wishlantern.com/faqs#faq14> But for the explanation to be an object carried in the wind, the wind speeds need to be much higher. Whatever theory is put forth, the proposed object's (balloon, Chinese lantern, bird, drone, etc.) speed and distance must match up with the line-of-sights from the airplane to the object. To help visualize this, an image of the northwest coast of Puerto Rico is shown in Figure 4. The exact location of the aircraft is plotted on the map as well as the lines of sight, which are based on the known azimuthal direction that the aircraft's camera is pointing. In order to make it easier to visualize, each subsequent time and line of sight is made in colors from white to yellow to orange. The lantern must lie somewhere on each line of sight (place a lantern anywhere on the white line of sight then the light yellow line of sight, etc. and try to match the wind direction and try to minimize the distance traveled in order to give the lantern theory the best chance of success) and the movement of the lantern must match that of the wind. The best possible scenario was created and the lantern's locations are represented by the four black circles. If you go to the enlarged map in Figure 5 you can see this more easily. Those four data points represent movement based on a wind out of the ENE, 69 seconds of time (01:22:14 to 01:23:23 as shown on the video), and the lantern covering 1680 feet in this time period. This equates to a speed of 16.6 mph. Not only is this near the maximum upper wind speeds listed for this day but it is far in excess of the wind that a lantern can withstand and remain airborne, which is closer to 5 mph. This eliminates a device similar to a Chinese lantern as a possible explanation.



The second issue with a Chinese lantern relates to a question of why didn't the IR camera pick up the separation of the lanterns earlier in the three minute video. With two distinct heat sources separated by a minimum of three feet (the width of a lantern) the MX-15 system would have detected the two heat sources for a majority of the video since the thin walls of a lantern, whether made of paper or plastic, will transmit IR radiation. Even in visible

light the lanterns are easy to discern as is demonstrated on page 6 of Lianza's own report. And to further establish that two lanterns would have been visible to the IR system, the SCU thanks Chris Isbert for his work to demonstrate that even two balloons without a heat source are easily separated by an IR camera. A video of his work can be found here: <https://www.youtube.com/watch?v=gl2EQhNB-So>

In page 11 of his report Lianza argues that the object did not go into the water but that instead the IR camera system lost track of the object because of "the fluctuating nature of the candle system." As has just been demonstrated, the speed required for a lantern to remain in the camera's line of sight require it to travel at speeds such that the "candle system" would not survive winds of 16 mph and greater. Additionally, the video in the previous paragraph establishes that even without a heat source the IR camera can easily pick up two balloons tied closely together.

Lianza also argues that the IR sensor loses the object while it is over land at other times and that the IR loss of signal has nothing to do with the object moving behind a tree or telephone pole. He states the time this occurs as 1:23:56 to 1:24:01 of the video. Lianza's argument actually supports the SCU version of the object disappearing behind trees and brush. These events are depicted in the Google Earth photo shown in Figure 6. In our report we indicate that at 1:23:35 the object appears to go behind a telephone pole at about 30 feet altitude and then three seconds later at 1:23:38 it goes behind the tree of about the same height or higher. You can see a yellow arrow near the top of Figure 6 that shows the clump of trees blocking the IR camera as the object passes by at time 1:23:38. The blue line on the map represents the path of the object. The aircraft is 3.5 miles away and in the direction of the upper right part of the image. After passing behind the tree, the object continues to drop in altitude as it heads out to the ocean. It passes through the yellow circled area which is the time when Lianza argues that the fading of the object proves that this is not due to passing behind trees. But if you watch the video closely you can see heavy amounts of brush and whether the object is passing in front of or behind the brush is difficult to determine. Furthermore, the terrain is dropping rapidly from 175 feet to 11 feet in the span of only 500 feet. In Figure 7 is an image of the brush taken in the same area as shown on the map. We thank Jorge Gorritz of Puerto Rico for providing the photograph of this area. It is not surprising that the object's IR image would fluctuate during this portion of the video. Once the object is over the water the same sharp image that is seen earlier in the video is seen again. The loss of IR imagery is consistent with an object that travels behind a telephone pole, behind a tree, and then drops rapidly through heavy brush as it heads out over open water.



Figure 6



Figure 7

Lianza's final argument is on pages 12-13 and come basically from calculations done by François Louange in Appendix 'A' on pages 16-23 using IPACO software. The work uses trigonometry to calculate an unknown value when two of three terms are known regarding distance, size of object, and the angular size of an object in a photo. This same technique is used in the SCU report and the concept of how to make this type of calculation is sound. Pages 17-19 deal with estimating the distance between the two objects in the video frames based on assumptions around the true distance of the object. This is interesting but does not bear on the question of whether these two objects are Chinese Lanterns that were tied together and have now come apart. The discussions on pages 20-23 do deal directly with the issue of whether these are Chinese Lanterns by attempting to calculate the distance to the two objects based on angular size of the objects and the known size of lanterns that are used at a holiday resort to the northeast of Aguadilla.

The problem here is not in the IPACO software. The problem is best described near the bottom of page 16 of the Lianza report when it is stated, "The size/distance ratio concerning the object by itself is more tricky to assess, given the fluctuating nature of this object's appearance in thermal infrared." This statement is true as throughout the three minute video the object varies in its size (i.e. infra-red signature) by very large margins. This is why the SCU report could only describe the object as somewhere between 3 to 5 feet in size. The statement that is not correct is made just a few words later with "...using carefully selected frames such a measurement could be performed." It is not reasonable to pick two specific frames out of over 7000 frames in the video and claim that these frames best match the object's "true" shape. The assumption that in this IR video one can "identify" the frames where the object's angular size reflects the object's "true" size is not correct and is demonstrated in Figure 8. The left side of the photo is one of the two frames chosen in the Lianza report. That report claimed that these two objects represented two Chinese Lanterns that were .0075(height) x .0071(width) degrees in size and equated to 3.1 feet x 2.95 feet. The right side of the photo is a frame that occurs only 2.5 seconds after the frame on the left. The arrow points to the upper object which has almost disappeared. But more importantly the lower object has increased in size significantly. The increase is so large that you can see visually that the object on the right is larger. The actual measurement of the object on the right is .0102 degrees or 36% larger than the largest measurement in the previous frame.

So are we to believe that the Chinese Lantern increased in size from 3 feet to 4 feet? Absolutely not. The reason for this dichotomy is simply because the object's IR signature changes so often that its angular size cannot be used to accurately measure the size of the object. Therefore the drawing and conclusions made on page 13 of the Lianza report are based on incorrect assumptions.

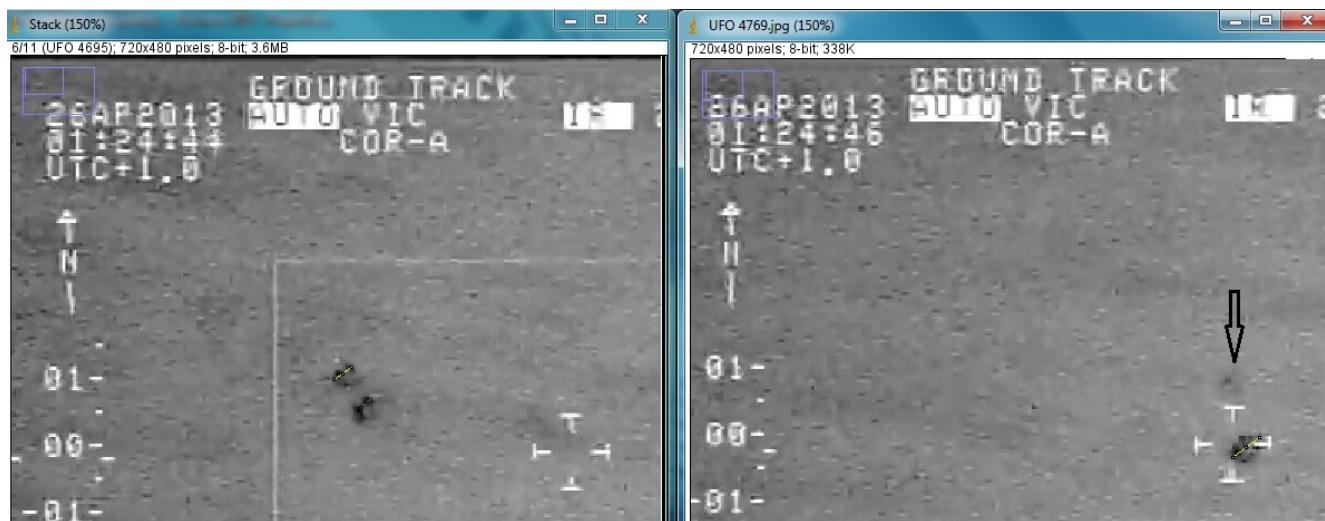


Figure 8

What is happening in this portion of the video also denies statements often made to try and explain the reason the object disappears in the water. Often the assertion is made that the object is not actually near the water and that the disappearance of the object into the water is just an illusion caused by either something blocking the unknown object or a degradation problem in the camera itself. If such a statement were true, as we mentioned earlier, that blocking or degradation is not affecting the water and in the right side of Figure 8, how is it that the top object is disappearing while the bottom figure is quite clear? And if someone were to argue, "Oh, the candle light sputtered out on the upper object first." then one need look only a few frames farther and suddenly the top object begins to reappear as shown in Figure 9.



Figure 9

Conclusion Whatever the object may be in the Aguadilla video, it is not a Chinese Lantern. First, in order to match the lines-of-sight between the camera and the object, any wind born object must travel a minimum of 16mph and this is too high a wind for a lantern to remain airborne. Second, the lantern theory does not explain the disappearance of the object behind trees and most importantly into the water. We have provided data to establish that the disappearance of the object is not an illusion and the only arguments as to why the is disappearance of the object is an illusion have revolved around 'could be' and 'could have'. Third, it was established that if these had been two Chinese Laterns tied together then the IR video system has the ability to separate the two objects and this was never seen. Lastly, the lantern theory assumption that a few key frames could be selected to do detailed and specific measurements is disproven.

As the original SCU report stated, we do not have an explanation for the object that is seen in this video. We cannot explain it as a bird, balloon, Chinese Lantern, astronomical object, or any type of aircraft or drone. We welcome others to evaluate the video and if possible propose a theory that explains the object that is observed in the IR for three minutes. But any explanation needs to fit within the entirety of the video and not within certain portions. An explanation should take into consideration the statements by the witnesses, the radar data track that shows up, the IR signature of the unknown, and the explanation should match up with the information provided in the video, which is extensive.