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Unidentified Aerial Phenomena. Heaven Battle

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Abstract: The Unidentified Aerial Phenomena (UAP) or Unidentified Flying Objects (UFO) objects collected in the main by branches of the U.S. military. Most were assessed as routine airborne phenomena. The remaining demonstrated unusual flight characteristics and required further analysis. Thus, UFOs as pop culture objects have become objects of scientific research. NASA and the Harvard University Observatory are engaged in UAP research. The Main Astronomical Observatory of NAS of Ukraine conducts an independent study of UAP. Here we consider an episode involving two UAP objects. The episode was observed on April 23, 2018, in Kyiv and lasted about 3 sec. The speed of the objects is supersonic, about 3 M.

Keywords: Astronomical and space-research instrumentation; Astronomical observation; Observation and data reduction techniques; Methods: observational; Object: UAP; Techniques: imaging;

1. INTRODUCTION

The 2022 Pentagon unidentified aerial phenomena (UAP) or unidentified flying objects (UFO) report covers approximately 510 catalogued UAP reports collected by branches of the U.S. military. "The 366 reports were assessed as routine airborne phenomena. The remaining 171 reports demonstrated unusual flight characteristics and require further analysis," the report said. Thus, UFOs as pop culture objects have become objects of scientific research. The main astronomical observatory of NAS of Ukraine conducts an independent study of UAP.

For observations we used two meteor stations. Two-side monitoring led to the detection of luminous object in the troposphere at an altitude of 2.6 km, moving at a speed of 2.3 Mach with a linear size of about 6 meters [1].

Monitoring led to the detecting of dark objects, with a contrast, to several per cent. Both types of UPAs exhibit high movement speeds.

We have drawn a meaningful conclusion from observations of UPAs. They are observed on a time interval in the sub-second range. They demonstrate high velocities and brightness variability. The detection of these objects is an experimental fact. Estimates of their characteristics follow from observational data. The authors do not interpret these objects.

2. RESULTS

We consider an episode involving two UAP objects. The episode was observed on April 23, 2018, in Kyiv and lasted about 3 seconds. Figure 10 demonstrates the flight of objects in the Appendix in gif format.

The bright object in Fig. 1 was escorted by a dark "fighter" that flew "backwards" and turned around to attack (Fig. 2). The top three squares in Fig. 1 show when the "fighter" fired three times. The object was hit but not destroyed. It changed course abruptly.

The bright UAP object in Fig. 3 demonstrates complex architecture. Fig. 5 shows that the bright object changes its appearance significantly during a 3-second flight.

The "fighter" looks like a dark spot against the bright daytime sky, although it is illuminated by the sun (Fig. 4). The bright object is about 400 times brighter than the background sky (Fig. 3).

As shown below, at a distance of 2.8 km, the object is about 20 meters, and the "fighter" is about 25 meters. The entire episode lasted about 3 seconds. The speed of the objects is supersonic, up to 1010 m/s and more.

3. OBJECTS ABOVE KYIV

The episode described was filmed on April 23, 2018, in Kyiv at about 9 am (Fig. 1) at 30 frames per second.

The bright object was escorted by a dark object (Fig. 2).

The bright UAP object demonstrates complex architecture (Fig. 3).

The dark object is believed to be a "fighter" (Fig. 4).

Fig. 5 clearly defined changes in the structural features of a bright object.

Fig. 6 demonstrates a "fighter" shot and the destruction of a bright object.

The shot from the "fighter" is clearly defined in Fig. 7.

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Fig. 1: UAP track on April 23, 2018, Kyiv.

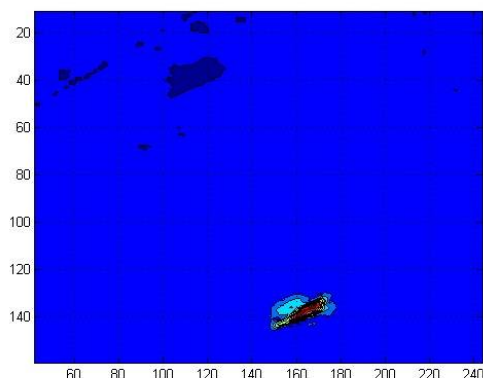


Fig. 2: UAPs on April 23, 2018, Kyiv.

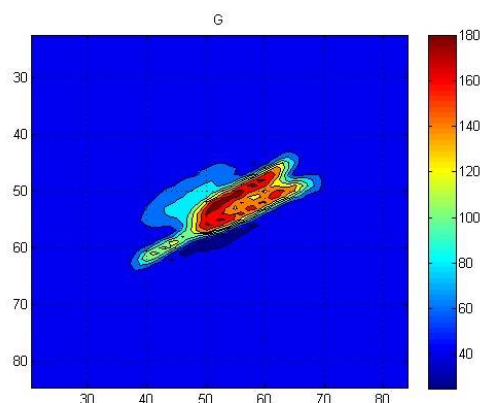


Fig. 3: The bright UAP object demonstrates complex architecture.

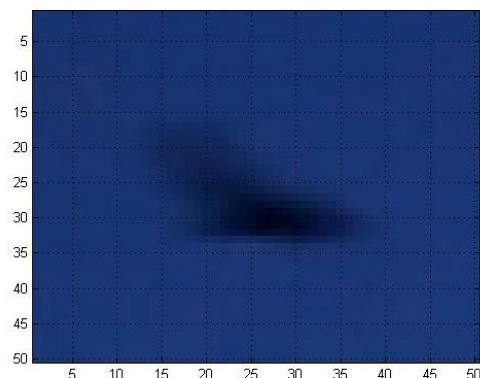


Fig. 4: Dark object, presumably a "fighter".

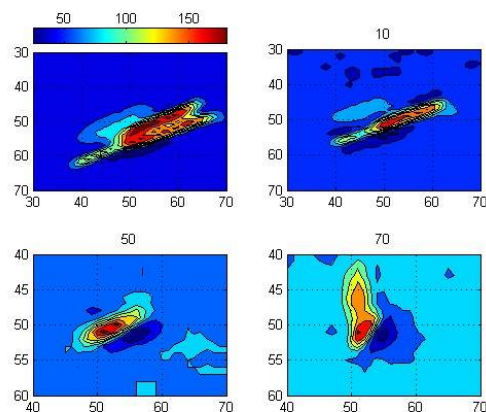


Fig. 5: Clearly defined changes in the structural features of a bright object (marked by the number frame).

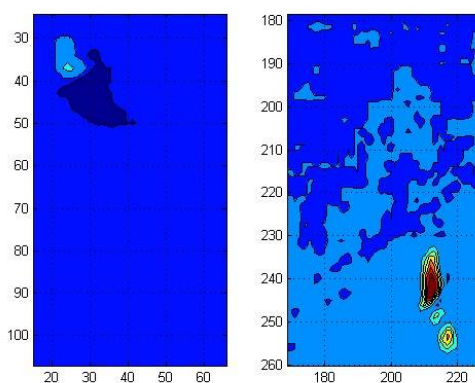


Fig. 6: A "fighter" shot and the destruction of a bright object.

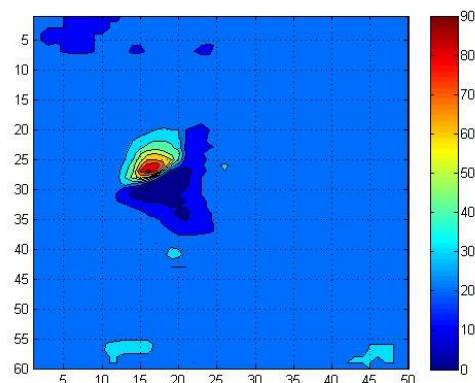


Fig. 7: A clearly defined "shot" from the "fighter".

Fig. 8 shows RGB data for the "fighter" object and sky background.

Fig. 9 shows photometric sections of the trace in the RGB rays. The extinction in the object is normalized to the intensity of the sky background in the vicinity of the object.

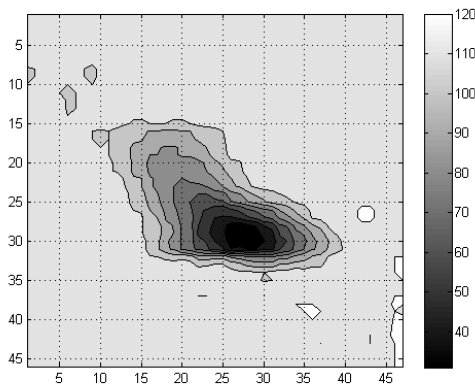


Fig. 8: RGB data for the "fighter" object and sky background.

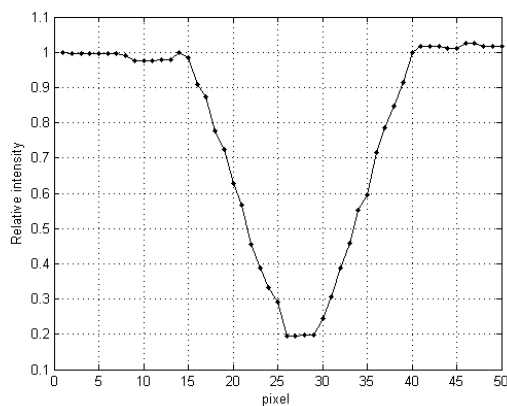


Fig. 9: Photometric sections of the object in the RGB rays.

4. OBJECTS CHARACTERISTICS

Determination of distance to an object can be determined by the colorimetry method [2], [3]. We use the approximation of a homogeneous atmosphere with a height H of 10 km, h is the height of the object above the horizon. One can find the object's distance by measuring the contrast of the object in the RGB rays in Fig. 9.

The object's distance $L = H / \sin(h) \cdot r$, where r is relative intensity.

Using the angular sizes of the objects in the images, we obtain a distance of 2.8 km, the object is about 20 meters, and the "fighter" is about 25 meters. The speed of the objects is supersonic, up to 1010 m/s or about 3 Mach.

5. SUMMARY

The episode described above was filmed on April 23, 2018, in Kyiv at about 9 am. The episode "Heaven Battle" was filmed by the author by chance, as a by-product during daytime observations of the Lyrid meteor shower.

The architecture and structure of the objects, dark and bright, differ significantly from those of military objects. The glowing object transforms its appearance and shape during a 3-second episode. It changes its size more than twice.

Colorimetry showed that the dark object has a low albedo. If we assume that the object shines by reflected light from the Sun, its distance is estimated at 2.8 km, and its size is estimated at 25 m. The speed of the objects is supersonic, up to 1010 m/sec and more.

The objects move at a speed greater than 3 Mach, move silently, and do not create a shock wave. This gives grounds to consider them UAP-type objects.

The entire episode can be considered an installation or demonstration. The presence of military action indicates that the objects belong to different sides of the conflict.

APPENDIX

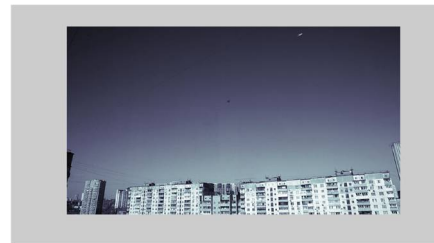


Fig. 10: Flight of objects in gif format.

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