Transmission of EVOs Through Metal

by

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Abstract

High-density and highly organized clusters of electronic charge, or EVOs, are shown to transit through metal with relative ease compared to that of single electrons. Upon reaching an interface between metal and vacuum, the charges exit the metal somewhat disheveled as clusters and propagate through vacuum as both free electrons and clusters. An EVO injection velocity of a few hundred volts easily penetrates 1 millimeter of aluminum. Although contrary to established electron penetration theory, lower injection velocities produce greater EVO mobility and lifetime within the metal target. The configuration used provides a cold, intense electron emission source without concern for either work function or geometry of the cathode.

Background

In the earliest publication of this set of measurements [1][2], the author was new at EVO interpretation and very mystified as to their outcome. In some of the particle pinhole camera recordings made, the images looked like a screen full of small specks where there should have been uniform illumination. Grasping for a description, the most ordinary explanation was seized upon and one of the effects seen was dubbed "Speckles." A justification of the speckle effect was couched in measurements available at the time as being caused by aluminum oxide nano particles knocked off the target and imaged by the camera, but which is now thought to be erroneous. It would be entirely appropriate to name this writing something like *Speckles Revisited* to emphasize the mistake made, because since that early time, a newer and perhaps more appropriate cause for the effect has been found and is advanced here.

This author doesn't feel bad in the least for misunderstanding what was seen because, as with anything truly new, there is often insufficient imagination to encompass this enormous departure from the reality regularly practiced in laboratory work. Occasionally it takes a period of time to elapse before ones head clears sufficiently to see the truth. It took the author nearly 10 years to awaken. As long as that is, it is still better than never awakening. The path from here on is ever steeper into an entirely unknown realm of new physics that is intensely exciting. Fortunately, the author as an experimenter is now equipped with sufficient imagination to handle nearly any upcoming surprise that is in store.

Experimental Setup

The experimental setup for using a particle type of pinhole camera is explained in detail in Ref. [1] and Ref. [2] while a schematic representation is shown in Fig. 1 on the next page. In essence, an EVO launcher generates an EVO from a negative going cathode pulse that then travels down an EVO guide and jumps a vacuum or low pressure gas gap in order to strike the foil or plate target. The backside of the target has a pinhole spaced a short distance from it that images the particles emitted from the target onto a micro channel plate type of electron multiplier, which is followed by a phosphor screen and a video camera. The image travels through both a deflector field and a retarding screen electrode for analysis methods not used in this experimental setup. Both electromagnetic and particle shielding is used where necessary.

A voltage called the extraction voltage is applied between the guide and the target in order to pull the EVO from the guide and onto the target. This voltage is the one largely responsible for the impact velocity of the EVO on the target although other dynamic effects due to EVO induction fields determine the actual landing velocity. These induction fields are difficult to determine due to their high rate of change but nearly always work in a direction to lower the EVO landing velocity. When adequate extraction field is not applied, the EVO takes a path to ground or the anode via an alternate guide channel and does not strike the target.

The optical images from the experiment were originally recorded on an analog video tape recorder and then digitized for introduction into this document. Digitizing errors introduced a choppy look to the images that are not found in the original copy but these images are still adequate for the purposes intended here.

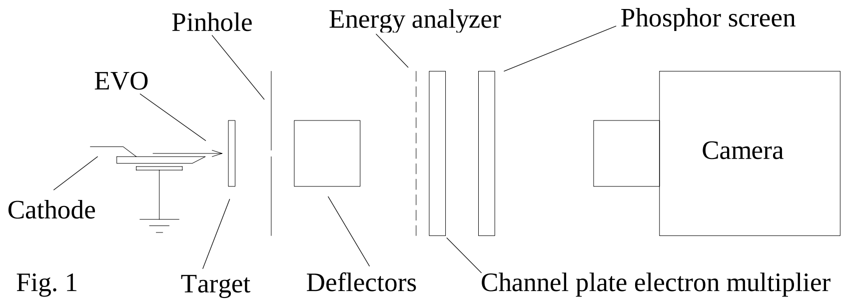

Fig. 1

Pinhole Camera Images

Pinhole camera images are shown in Fig. 2 through Fig. 13. They are arranged both in order of the target thickness as well as EVO strike intensity. The first images shown in Fig. 2 through Fig. 10 use an aluminum foil target 0.001 inches thick in order to keep a reasonable degree of EVO order in the emerging shower of charge that is imaged by the camera. The later images shown in Fig. 11 through Fig. 13 are showing the emergence of mostly electrons without the characteristic speckles because the target is 0.04 inches thick and the bombarding velocity is higher causing a higher degree of EVO disruption on impact. Annotation accompanying each image describes specialized considerations.

Fig. 2. Light bombardment of a 0.001” thick aluminum target spaced about ¼” from the imaging pinhole. Specks are clusters of electrons.

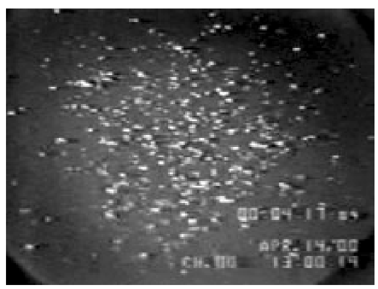

Fig. 3. Slightly increased EVO bombardment of same target shown in Fig. 2. Increase is due to increase in extraction voltage on target.

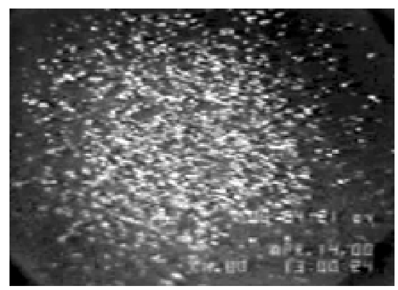

Fig. 4. Further increase in level of bombardment showing more specks in field.

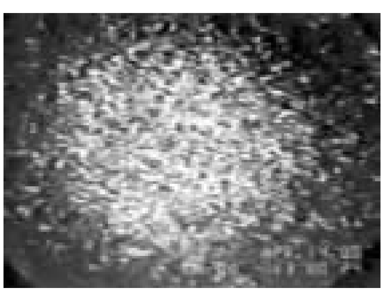

Fig. 5. Bombardment nearing saturation level in localized regions. Emission density of each speck is about 10^6 amps per square centimeter.

Fig. 6. Saturation level of electron multiplier occurs in most of the field of view. The video camera has also reached saturation. The multiplier was blown out in the next frame.

Fig. 7. Speckle pattern showing EVO emergence off center of target area while electron emission shown as light background is centered.

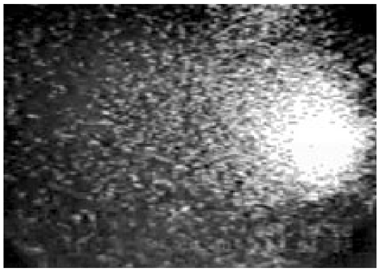

Fig. 8. Another off center strike similar to Fig. 7 but having higher average intensity with a strong and homogenous or saturated emission center.

Fig. 9. A slight pattern of speckles is beginning to show that resembles a bead chain as seen on witness plate images indicating a degree of connectivity between EVOs.

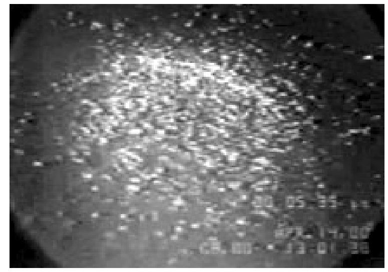

Fig. 10. An increased degree of connectivity in pattern is showing at the top. There appears to be a fold back of a portion of the image as if internally reflected.

Fig. 11. Shot of 0.040” thick aluminum on camera nose without using a pinhole. Shadowing due to electron emission from the target images the deflection plates.

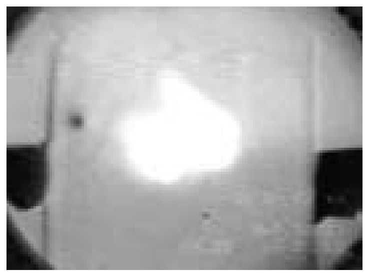

Fig. 12. A higher intensity shot similar to Fig. 11. A test for X rays was run but only a trivial level was found. The image is formed primarily from point source electrons.

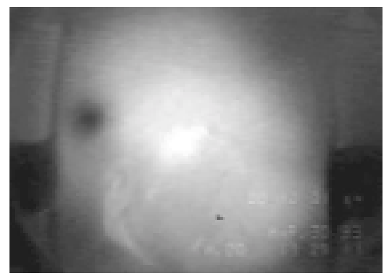

Fig. 13. A diffuse shot using the same target as in Fig. 11 and 12 showing a ghostly image in the lower left corner.

Summary

The technique for EVO exploration used here shows another of the many deviations found from the behavior of simple electrons. Aluminum foils 0.001” thick can be penetrated using several hundred volts accelerating potential and still show electron clustering upon emergence while aluminum samples 0.04” thick can be penetrated resulting in dishevelment of the clustering action. The data generated and reported here was done in the quest for answers on an entirely different effect and no attempt was made to optimize or clarify results at the time the work was done. If this work is to be validated for common usage, others must do the new work in order to expand the basic information available. Additionally, nothing beats first hand information. Since the initial discovery of this metal permeability effect, many laboratory uses have been found for the intense electron source produced but none of these have been applied commercially. The largest area of interest in EVO technology at this time is in its application to energy sources and propulsion devices. Reference to several essays by the author on these subjects can be found at: www.svn.net/krscfs/.

References

[1] K.R. Shoulders, *EV--A Tale of Discovery*, Austin, TX, 1987. A historical sketch of early EV works having: 246 pages, 153 photos and drawings, 13 references. Available from the author at: 365 Warren Dr., Ukiah, CA 95482 (707) 467-9935, e-mail at: krscfs@svn.net

[2] U.S. Patents on EV technology by K. R. Shoulders. 5,018,180 (1991) - 5,054,046 (1991) 5,054,047 (1991) - 5,123,039 (1992), and 5,148,461 (1992).