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Detection of Torsion Field Based on Measuring the Dark Current of Silicon Photodiode

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***Abstract*—The torsion field detector is very necessary for the research works of torsion field. Because it's very difficult to measure the torsion field directly, most of the detectors are based on measuring the changes of physical, chemical or biological parameters indirectly. This work studies detection of torsion field by way of measuring the dark current of silicon photodiode. For this purpose, a silicon photodiode which works in reverse bias state and an ultra-weak current detector should be used in all the related experiments, because the dark current of selected photodiode is in pA (10^{-12}A) level. This approach was tested with different kinds of torsion field generators not only in local configuration, but also in non-local configuration. Based on the analysis of acquired results, this approach based on measuring the dark current of silicon photodiode can be used for detecting torsion field.**

I. Introduction

Torsion field generators and detectors are the basis of research works of torsion field. Generally speaking, torsion field detector is more difficult to make than torsion field generator.

In the third chapter of [1], Serge Kernbach introduced many approaches for detecting torsion field or 'high-penetrating' emission. Some of them are based on measuring the changes of parameters in solid-state materials, such as dielectrics, semiconductors, ferromagnetics, resistors and so on. Some of them are based on the liquids, among them, water is the most sensitive to torsion field according to previous research works. So the water-based approaches, such as dpH [2], [3], EDL [4], [5], DTA [2], UV Spectrophotometer [1] and so on are very sensitive. But the weakpoint of the water-based system is that it reacts to the torsion field slowly.

V. Zhigalov also introduce many kinds of torsion generators and sensors in his book called "Specific effects of Non-electromagnetic radiation" (rus), more details please see [6].

In the book with the property of collection of papers [7], the author mainly introduces the torsion field in the 7th and 8th chapters. There are also many approaches introduced, and how the left-handed and right-handed torsion field can influence the properties of different materials is also introduced.

Author ever used the torsion balance approach consisting of a wooden frame to detect the torsion field nature of scalar wave generated by Tesla scalar system [8]. But there is no data recording in this approach.

In this work, author wants to test the semiconductor-based approach, which is based on measuring the dark current of silicon photodiode using an ultra-weak current meter. According to the recorded data, the results are positive. The sensor can not only indicate the strength of torsion field, but also indicate the direction of torsion field, furthermore, non-local phenomena can also be detected.

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II. Description of methods and devices

A. Methods

For examining the ability of the sensor based on photodiode, a variety of generators based on different principles were used. And both basic local experiments and non-local experiments were conducted to show the ability of the sensor. In the basic local tests, the sensor and generator are placed in a short distance between them, and after the sensor is stable, the generator will be turned on with the help of a wireless relay module. During the experiments, operator should be in the place far away from the sensor and generators. In the non-local experiments, a high-precision thermostat is required to keep the sensor homothermal, and the generators should be turned on after the current of sensor becomes stable or linear. In such experiments, a non-local link is required to connect the sensor and generators. The standard Shkatov-Zamsha approach [9] is used in all the non-local experiments. A photo of sensor should be placed on the generators during the impact time.

For analyzing the recorded data, a software is programmed with some analytical methods including the linear regression, filter with optional points from 10 to 120, slope calculation, filter after the linear regression and so on. So these methods can be used efficiently to decrease the noises and find out the little change after the impact.

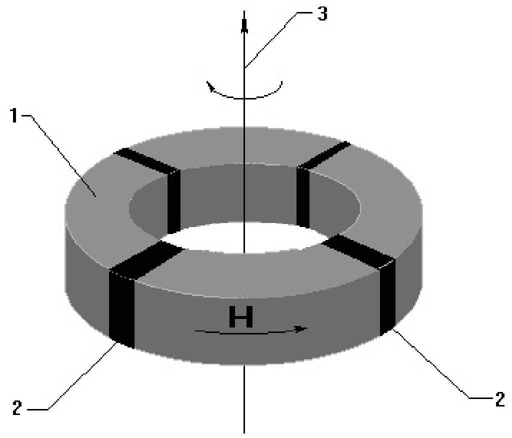


Figure 1. Basic structure of the rotator in the spin field generator. 1 - Ferrite ring 20x12x6 mm, 2 - ferrite-barium magnets, 3 - the rotation axis.

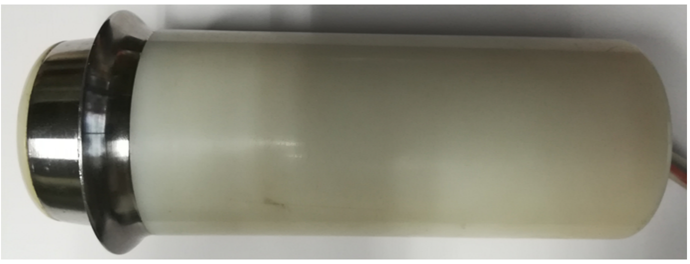


Figure 2. The physical figure of Comfort-5 series spin field generator, polarization: SR.

B. Spin field generator

Spin field generator introduced in this section is invented by A.A. Shpilman in Kazakhstan. The generator of Comfort-5 series was used in all the related experiments.

The basic structure of the spin field generator is in Fig. 1 and the physical figure is in Fig. 2. The rotator which is the core of the generator consists of a toroid, which is made of ferrite-magnetic material. And four permanent magnets whose magnetization direction is perpendicular to their own plane are inserted into the cylinder. When it works, the ring rotates in a counterclockwise direction, at the same time, the four magnets, which are inserted into the cylinder should generate a magnetic field, whose direction is opposite with the direction of rotation. More details please see [10].

C. LED generator

The LEDs used in this generator are normal LEDs but work in unusual mode. LEDs usually work under a low DC forward voltage continously. But all the LEDs in this generator work in a mode of high-forward-voltage pulses. Besides the EM component, LEDs also generate a "high-penetrating" component [11][1]. This unusual effect was discovered in laser and LED by A.V. Bobrov for the first time. Up to now, there are two versions of LED generator, one is made by A.V. Bobrov, which works in an analog activation mode; the other one is made by Serge Kernbach [1], which works in a digital activation mode. Author made the LED generator used in this work according to [1], please see Fig. 3, the effect can be examined by some water-based sensors. More detailed description can be found in [12], [5].

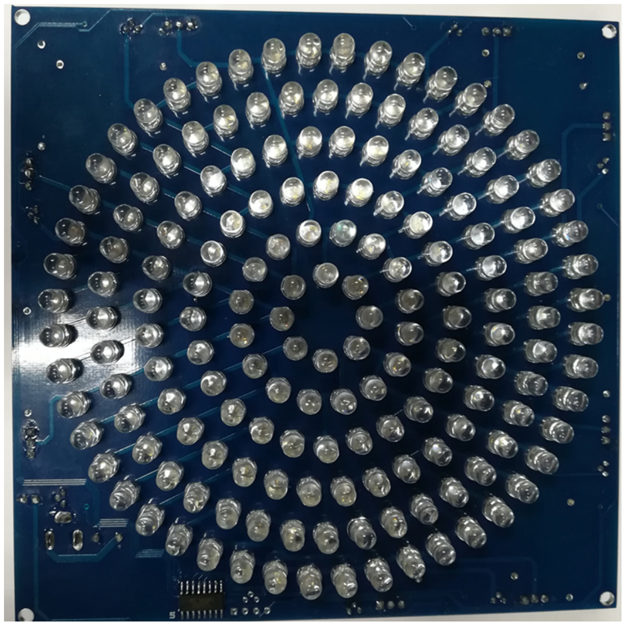


Figure 3. The LED generator used in experiments.

Figure 4. The Small Akimov generator used in experiments.

D. Small Akimov generator

Small Akimov generator is a very famous and classical torsion field generator designed by A.E. Akimov, who is a famous torsion field scientist. This kind of torsion field generator was used in many torsion field related research works in USSR. The basic principle of it is the interaction between the magnetic field – H and the electric field – E, which are orthogonal with each other. Then the Poynting vector S = [E × H] can be generated. In small Akimov generator, the S is rotating. Because the generator is shielded by the metal box around, so only the torsion component is emitted out through the copper cone. More details please see [13], [14].

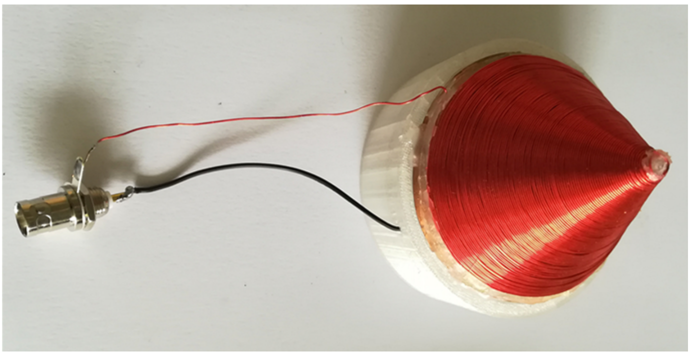


Figure 5. The spinning Poynting Vector generator used in experiments.

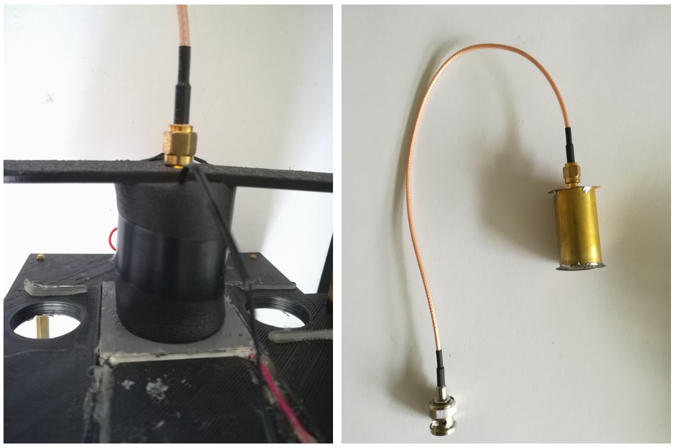


Figure 6. Sensor with thermostat (left); Sensor cell (right).

E. Spinning Poynting vector generator

In fact, this kind of torsion field generator is the same with Akimov generator. But there are varieties based on the basic principle. For example, Serge Kernbach made the new type of such generators with more modern components and technology [15]. He called the new generator "Circular Poynting Vector (CPV)" generator and tested it with static E/H field with the help of EIS. Another variety is not circular Poynting vector, but the planar Poynting vector generator designed by Vitaliy Zamsha [16]. In this generator, there is no spinning action of the Poynting vector.

Author also made own spinning Poynting vector generator based on the basic principle of Akimov generator and it's also a variety, see Fig. 5. The magnet at the bottom of the generator is replaced by a more strong neodymium magnet. Between the copper cone and the copper coil, there is a plastic cone made by 3D printer, whose thickness is about 2mm. So if signals are applied to the copper cone and the copper coil, electric field will be generated, whose direction is vertical to the inclined plane of the copper cone. So the component of the electric field will be orthonormal with the magnetic field. Then spinning Poynting vector will be formed around the plastic cone.

F. The sensor based on photodiode

The whole system of the sensor consists of two parts: photodiode circuit and ultra weak current meter. After the output of the current meter, an A/D system with 24-bit precision and wireless signal transmission system is required to send the data to the computer. In some earlier experiments in this work, the data of temperature is not recorded and most of earlier experiments are in local test mode. Then in the later experiments, higher precision of photodiode is required to conduct the non-local experiments, so the thermostat and temperature sensor are added.

1) Photodiode circuit: Because the main principle is measuring the dark current of photodiode, the photodiode should be shielded from light and EM. This is the most different point with the normal use of photodiode. Generally speaking, photodiode is used to detect the density of light or the number of photons in precision mode. But for the purpose of detecting torsion field, only dark current of photodiode should be measured.

Dark current of photodiode means the reverse direct current generated by the P-N junction under the condition of reverse bias voltage without incident light, generally because of the diffusion of charge carrier. The principle of the generation of diffusion is that in the internal of P-N junction, there are many electrons in the N zone and there are many holes in the P zone, so because of the difference of concentration, the electrons in N zone will diffuse to the P zone; at the same time, the holes in P zone will diffuse to the N zone for a dynamical balance. Torsion field can probably influence this dynamical process.

In this work, author usually choose the photodiode with ultra low dark current in pA level. So for the purpose of both light and EM shielding, the photodiode should be placed in a metal container. Copper foil is suitable for this purpose, but aluminum foil should not be used because of the blocking effect for the torsion field. Photodiode works in a reverse offset mode, a suitable reverse bias voltage should be added to the cathode of photodiode. As to the choice of photodiode, brands or types, author will suggest some: S1226 from HAMAMATSU in Japan, PC10-2-TO5 from Pacific Silicon Sensor in USA or the photodiodes from First Sensor in Germany. Of course, there are also other types, some of these types were used and tested in the experiments of this work. Fig. 6 shows the physical figure of sensors.

2) Ultra weak current meter: The ultra weak current meter in this work is in pA (10^{-12}A) level. So the noise should be considered carefully. The input part should be specially designed on the circuit for good isolation. For this purpose, a BNC plug is used here, because there is the PTEF material inside. The outside of BNC plug is grounded and the center of BNC plug is connected to the input area. All the wires here should go through the air but not the surface of the PCB.

The weak current meter is different from the weak voltage meter in terms of the circuit. The core schematic diagram of current meter is in Fig. 7:

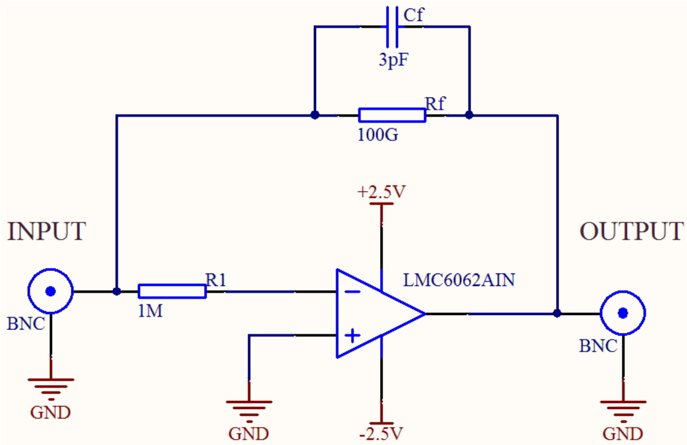


Figure 7. The core schematic diagram of the ultra weak current meter.

Figure 8. The configuration with cover (left) and without cover (right).

From Fig. 7, the circuit is a classical I/V circuit. The selected operational amplifier is LMC6062AIN because of its low bias current which is 10fA; its low working current which is 20uA and low work voltage which is 5V. The feedback resistance should be adjusted with different range of current according to different types of photodiode. In this schematic diagram, the theoretical output signal is 100mV/pA. There are also other types of operational amplifier can be selected, such as the LMC6042, LMP7721 and so on.

III. Results of experiments

This section will describe the detailed results and analysis with different generators separately, because there is different reaction of the sensor with different generators. In earlier experiments, non-local experiments will not be discussed, because there is no thermostat with good performance, leding to the sensitivity of photodiode is not enough. Only after the thermostat system is built, non-local experiments are conducted because of the qualified sensitivity.

A. Experiments with spin generator of Comfort-5 series

Along with the development of torsion field generator, the protection from torsion field becomes more and more important. A famous company on this topic is Spinor International from Ukraine [17]. They provide series of products used to protect human from the harmful torsion field rediation of mobile phones, monitors of personal computers, base stations for mobile phones, WIFI devices and so on. And the inventor of the spin generator of Comfort series, A.A. Shpilman, also made great contribution on this topic. There is a cover in front of each of his spin field generators. The purpose of the cover is to weaken the intensity of spin field from generator. This is a very important function. The cover must be put on when the generator is not in use.

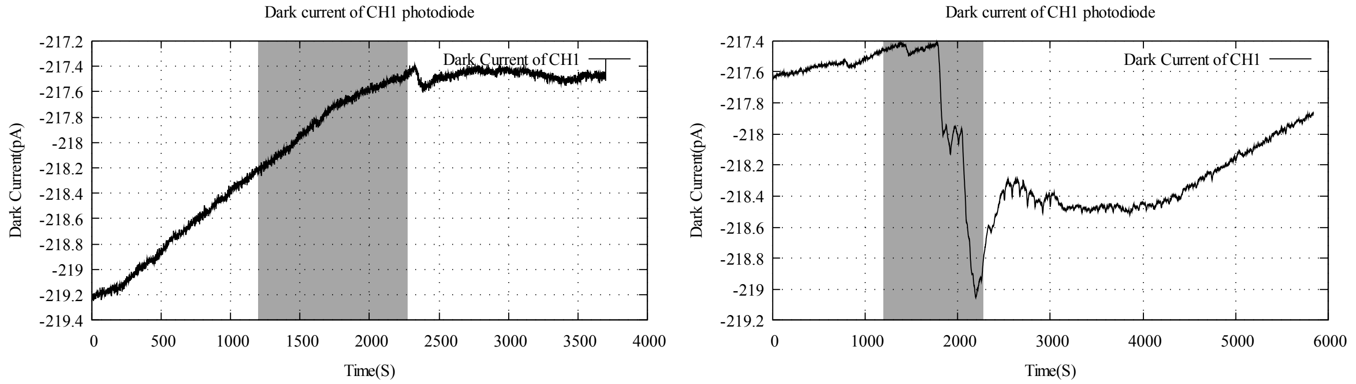
To test the function of this cover, author used the sensor based on photodiode to measure the spin field from generator of Comfort-5 with and without the cover. The reaction of sensor should be different in these two configuration.

Fig. 8 shows the different configuration with cover and without cover. If the cover can weaken the generated spin field, the reaction of sensor with cover on the generator must be less than the configuration without cover on the generator. Fig. 9 shows the results of different configuration.

From the results, there is almost no reaction of the sensor when the cover is put on the generator, but if the cover is put off the generator, the reaction of the sensor is huge. The impact time is same in both configuration. This can confirm the function of this cover, it seems that the cover can weaken the intensity of the generated spin field into a very low level.

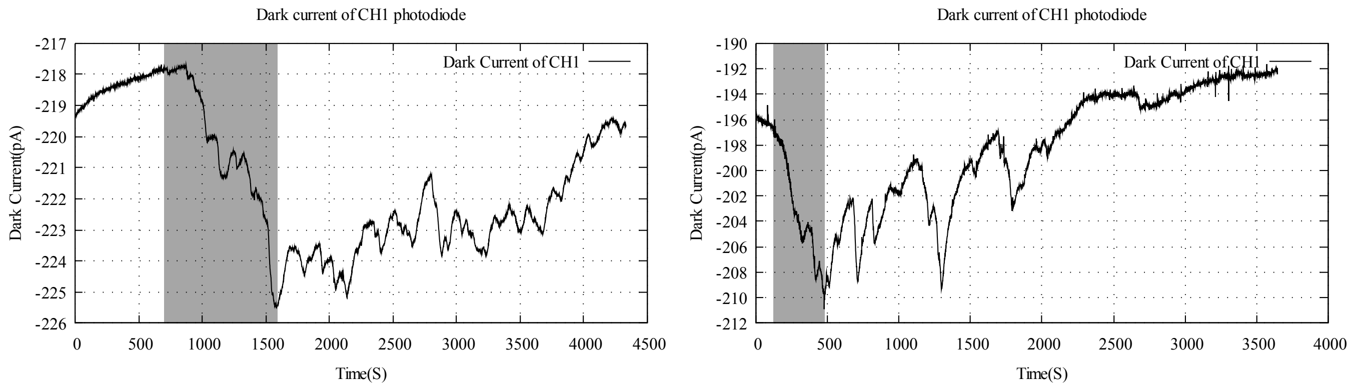
There is also another feature of this spin field generator of Comfort-5 series according to the inventor – A.A. Shpilman's website. *"When the rotation is stopped, the intensity of spin-field decreases to some constant value that can be retained for several weeks, i. e. the spin-field (and it's influence) can remain even when the generator is turned off [10]. "* This phenomena is called "after effect" or "phantom effect" according to previous work [1]. The sensor based on photodiode also detected such phenomena with the spin field generator in some experiments, but not in all experiments. Fig. 10 shows some results and the configuration of sensor and generator is the same with Fig. 8.

From the Fig. 10, there are still some peaks, whose trend is the same with the trend in impact time, after the generator is turned off. The current of the sensor usually recovers to the level before the impaction, but in the two experiments in Fig. 10, there is still reaction after the generator is turned off, just like the generator is turned on again. After some time, the peaks disappeared, maybe the intensity of the spin field after turned off decreases to a weak constant value step by step.



(a) (b)

Figure 9. The results of different configuration: (a) with cover on the generator; (b) without cover on the generator. Grey area means the impact time.



(a) (b)

Figure 10. The possible "after effect" in some experiments. Grey area means the impact time.

B. Experiments with LED generator

The effect of "high-penetrating" emission generated by LED generator can be detected by many sensors, such as EDL, EIS and so on. So in this work, the LED generator is used as a classical generator to impact the sensor based on photodiode. According to the results, positive results are achieved in both local and non-local tests.

Fig. 11 shows some results in local tests. The sensor shows the same trend after the beginning of impact and after impact time, the current recovers to the original value or trend slowly. These results show obvious correlation.

In the non-local tests with LED generator, although the thermostat was not installed yet, but the results from Fig. 12 and Fig. 13 still show something positive. In the Fig. 12, although there is no temperature recording, but the current in the sensor is linear enough before impact and during impact time, there is obvious reaction of the sensor. Experiment was conducted in deep night and in a closed lab, so although there was no thermostat, the environment around the sensor was very stable relatively speaking. In the Fig. 13, the temperature sensor was installed but there was still no thermostat. We can see the change of temperature during the impact time is under 0.02 degree centigrade.

C. Experiments with Akimov generator

Akimov generator is the most classical torsion field generator. From Fig. 4, although the basic principle of it is based on EM approach, but it is shielded with metal all around it, so only torsion component can be emitted out from the copper cone. In this work, only non-local tests were conducted with Akimov generator in the distance of 3m and 5km, the achieved results are very interesting.

These two experiments are all under the non-local configuration. In Fig. 14, the distance between the sensor and generator is only 3m, the photo of photodiode is placed on the top of the copper cone of Akimov generator. It should be noted that the sensor, data recording system and Akimov generator are all powered by a Li-battery of 12V, the receiver and generator are all independent system. The sensor is still influenced by generator in a short distance with the help of non-local link:the photo of photodiode in the sensor. Generally speaking, such great influence can only be achieved in the direct impact mode. At the same day, the Akimov generator was taken to another

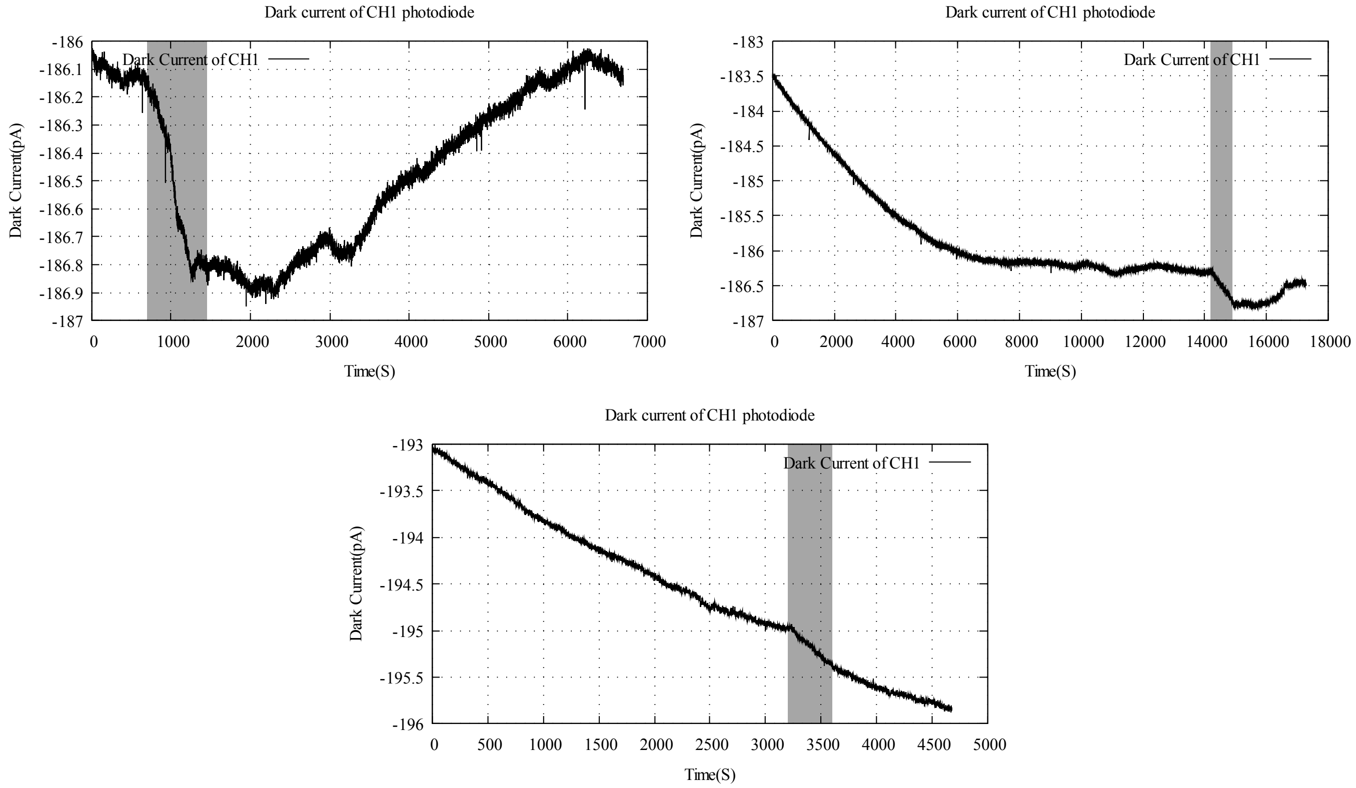
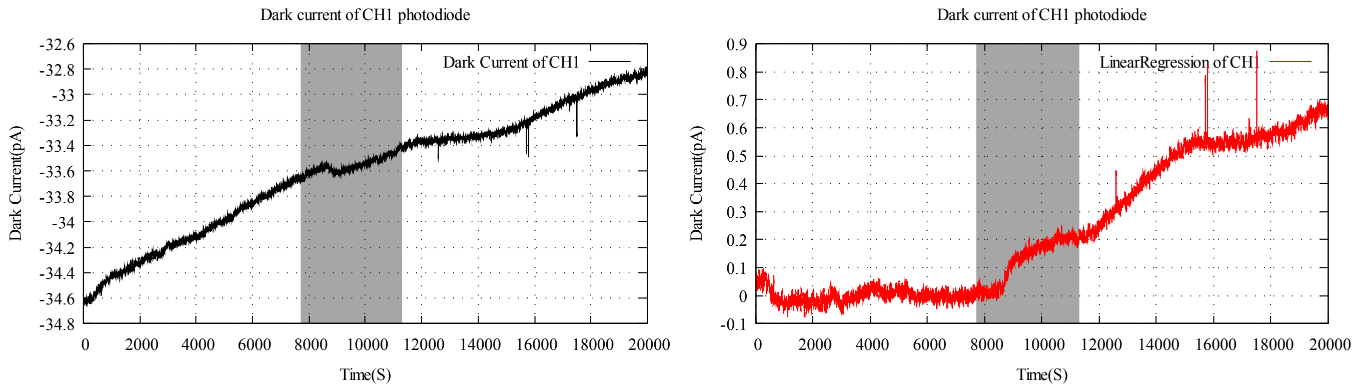


Figure 11. The local tests with blue LED generator. Distance between sensor and generator is 10 cm. Grey area means the impact time.



(a) (b)

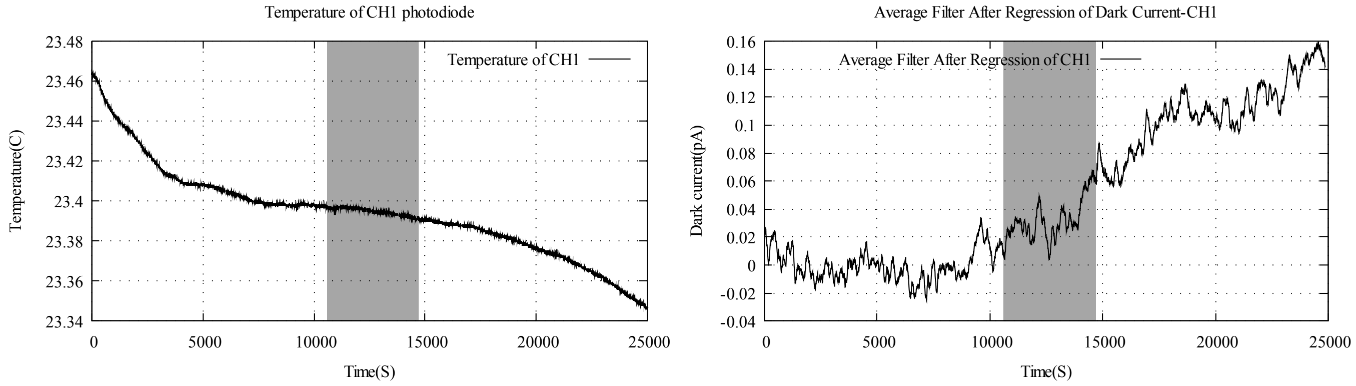
Figure 12. Non-local test with blue LED generator, distance between sensor and generator is 3km, non-local link is the photo of photodiode in the sensor. Grey area means the impact time. (a) is original data; (b) is linear regression of data.

place 5km away from the sensor. The Fig. 15 shows the result, there is also obvious change of the current, although the trend is different from the result of 3m. It's hard to say why the difference happened, because the principle or theory for non-local phenomena is still not fully clear yet although there is much non-local phenomena. It needs further research.

D. Experiments with spinning Poynting vector generator

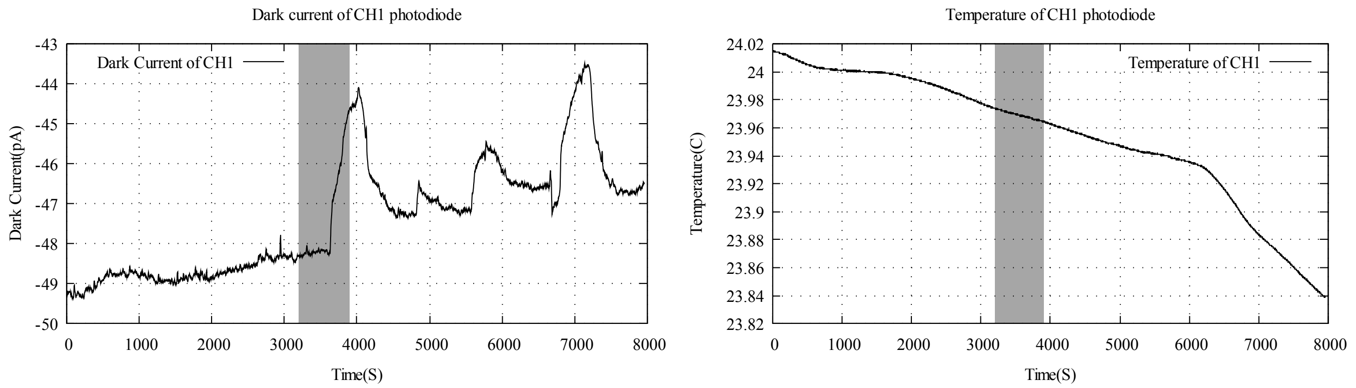
This section will be divided into two parts because of the different types of photodiode used in the sensor. And there are also more experimental results than other parts, because with the development of both sensor and torsion field generator, the results under this configuration for non-local experiments in this part are more stable and more easily replicated.

The signal added into the spinning Poynting vector generator is also not normal and weak signal, but high-voltage pulse signal, whose range is between 2000 to 3000V. So between the coil and copper cone in the generator, a very strong electric field is formed in 10^6 V/m level. So with the positive pulse signal, right-handed torsion field will be generated; with the negative pulse signal, left-handed torsion field will be generated.



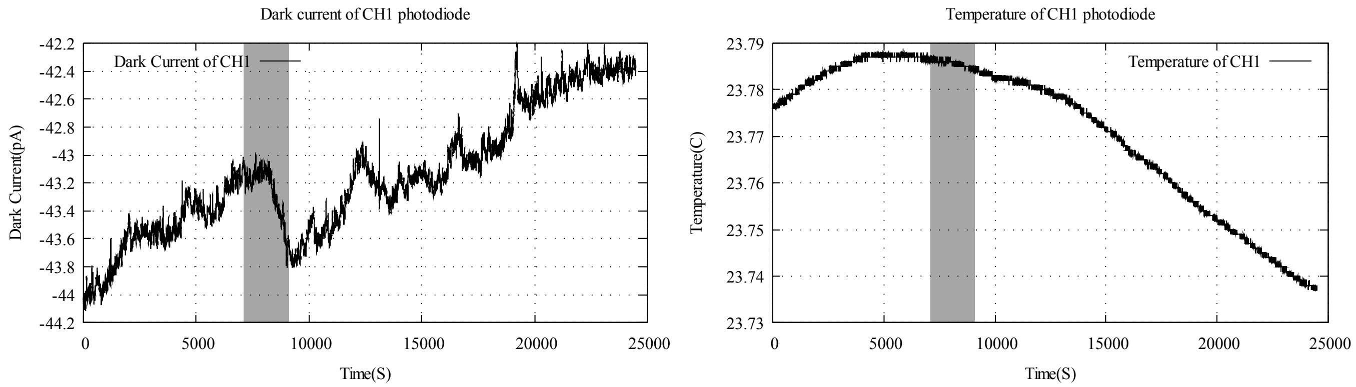
(a) (b)

Figure 13. Non-local test with purple LED generator, distance between sensor and generator is 3km, non-local link is the photo of photodiode in the sensor. Grey area means the impact time. (a) is the temperature data; (b) is filtered data with 120 points after linear regression.



(a) (b)

Figure 14. Non-local test with Akimov generator, distance between sensor and generator is 3m, non-local link is the photo of photodiode in the sensor. Grey area means the impact time. Polarization: right-handed. (a) is data of current; (b) is data of temperature.



(a) (b)

Figure 15. Non-local test with Akimov generator, distance between sensor and generator is 5km, non-local link is the photo of photodiode in the sensor. Grey area means the impact time. Polarization: right-handed. (a) is data of current; (b) is data of temperature.

Two types of photodiode were used in the series of experiments in this section, one is normal silicon photodiode with low dark current, the other one is silicon avalanche photodiode. They both have their own performance to be used in the sensor for detecting the ultra-weak non-local signals.

1) Experiments with normal silicon photodiode: The sensor in this section is different from others, two photodiodes with the same types are used in this sensor for

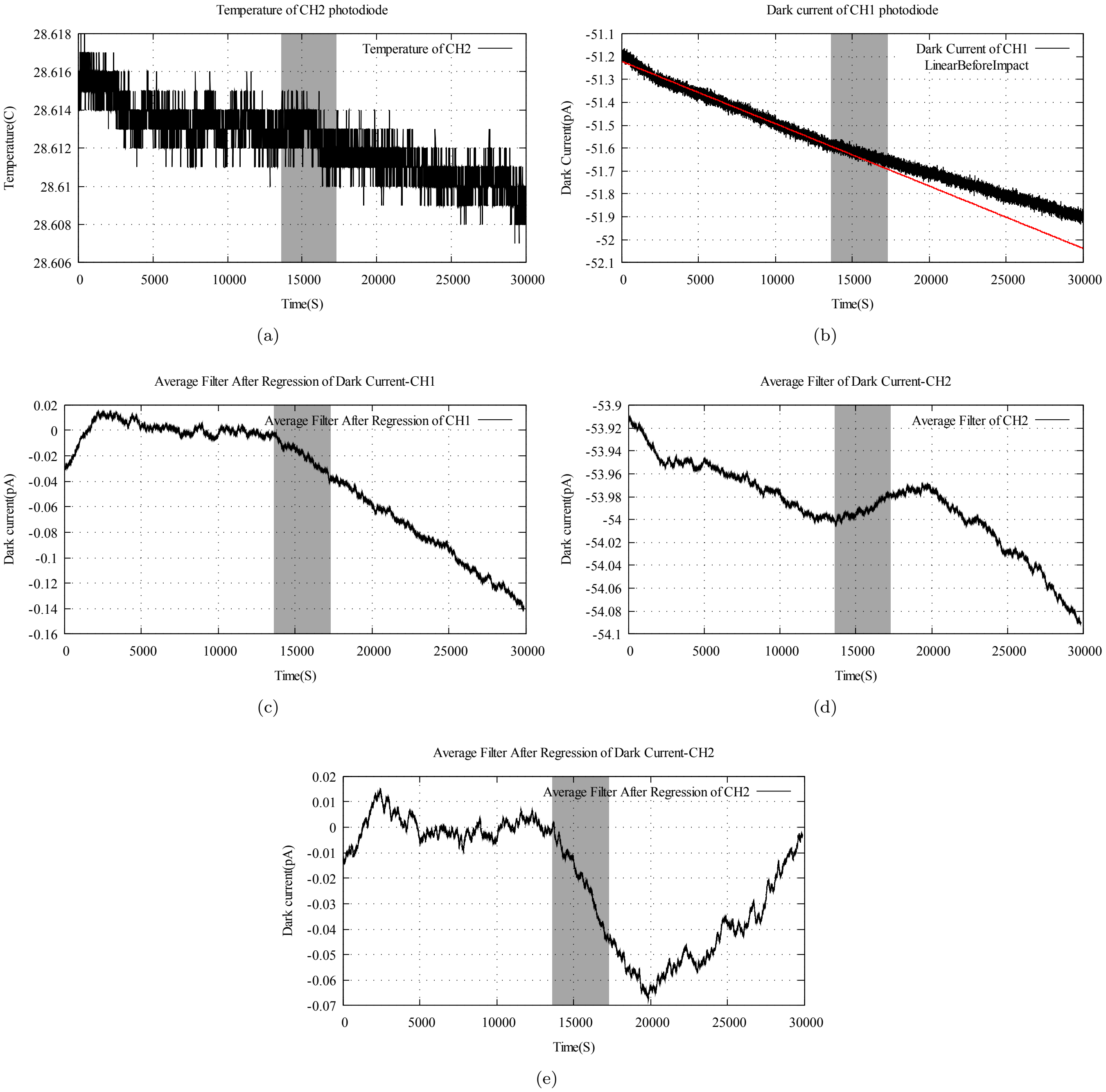


Figure 16. Exp20170918: Non-local test with spinning Poynting vector generator, distance between sensor and generator is 5km, non-local link is the photo of CH2. Grey area means the impact time. Polarization: right-handed. (a) temperature of both channels; (b) data of CH1; (c) filtered data with 120 points after linear regression of CH1; (d) filtered data with 120 points of CH2; (e) filtered data with 120 points after linear regression of CH2.

improving the sensitivity. For example, we take photos of the two photodiodes separately before the photodiodes are installed into the thermostat, the two photos of photodiode are in Fig. 17. Theoretically, if we impact one of the two photos, one change but other one doesn't change, we can use the differencial approach to improve the sensitivity. This is the original intention of this design. But in practical experiments, the results don't show this performance as we wanted.

Fig. 16 shows the result when the generator only impacts one of the two photos. As we can see, both of the two data channels change obviously after impact. It's possible that the two photodiodes are too closed. In order to keep the temperature of both channels exactly the same, the two photodiodes are put together closely and a temperature sensor of LM35 is used to record their joint temperature. It seems that there is an effective area of torsion field in non-local experiments: if the other sensor is in this area, it

Figure 17. Two photos of photodiodes in the two channels of the sensor.

will also be affected, if the other sensor is out of this area, it will be not affected.

So after the experiment in Fig. 16, both of the photos were used in further experiments. This means on the generator side, both of the photos will be placed on the top of generator and the two photos are overlapping. So torsion field from generator will impact both of the photodiodes. Fig. 18 and Fig. 19 show the results under this configuration. It seems that the influence on CH2 is still stronger than CH1 from both results. And there is another obvious phenomena that the influence on the sensor with the two photos is much stronger than the configuration with one photo according to the variation in the results of linear regression. Besides the factor of number of photos, there is another factor - temperature. The configuration of PID controller for thermostat is different, the temperature in Fig. 18 and Fig. 19 is higher than Fig. 16. This factor will affect the current in the sensor.

2) Experiments with silicon avalanche photodiode: The purpose of this series of experiments in this section is mainly to explore whether the silicon avalanche photodiode is more sensitive than the normal photodiode, because as well-known, there is the property of non-linearity when photodiode works in an avalanche mode.

To investigate the performance of the silicon avalanche photodiode, another sensor system was built with the same configuration including the thermostat, ultra-weak current meter, that worked in the range of ± 2500 pA, feedback resistance was 1 GOhm. Because the dark current of avalanche photodiode is much larger than the normal photodiode, especially in the avalanche mode. Because the temperature was controlled by an independent control system, the temperature of sensor was not recorded, but only the temperature of room was recorded. Fig. 20 shows the sensor system used in the experiments of this section.

In this series of experiments, only non-local tests were conducted to examine the sensitivity of the sensor based on avalanche photodiode. The method used is still the same with previous: Shkatov-Zamsha approach. The configuration on the generator side is shown in Fig. 21 (all the configuration in the experiments with spinning Poynting vector generator is the same). The photo of avalanche photodiode is printed on a A4 paper, on the generator side, only place the paper on the top of the generator and turn on the generator in the impact time.

Fig. 22 shows the interesting result for this configuration. The operation on the generator side was not just ON or OFF in previous experiments, but the polarization of torsion field was also changed. The protocol on the generator side is as follows:

- 0-3000s: Before impact
- 3000-4600s: right-handed TF
- 4600-5600s: left-handed TF
- 5600-6200s: right-handed TF
- 6200-7100s: left-handed TF
- After 7100s: turn off the TF generator

If we observe the result in Fig. 22, we can see there are two different trends of the dark current of the photodiode according to different polarization of torsion field on the generator side. The right-handed torsion field makes the trend up but the left-handed torsion field makes the trend down. From the (b) in Fig. 22, the slope is also calculated in different time domain according to the protocol on the generator side (the value of slope is multiply by a large coefficient: 100000, because of the large value in X axis), the calculated slope is just like the digital signal, the slope more than 0 can be considered as "1" and the slope less than 0 can be considered as "0".

Fig. 23 also shows a similar result but there is no protocol for this, only one impact of right-handed torsion field was applied. To judge whether the results are positive or negative, not only the change in the impact time should be considered, but also the change after the impact time should also be considered in some situation. From the (b) of Fig. 23, when the impact began, the current went up instantly, this showed great correlation. And it also should be noted that after the impact, the current went down instantly and then went up again, this also showed the correlation from other side.

The sensor based on the avalanche photodiode was improved in the further development, a temperature sensor,

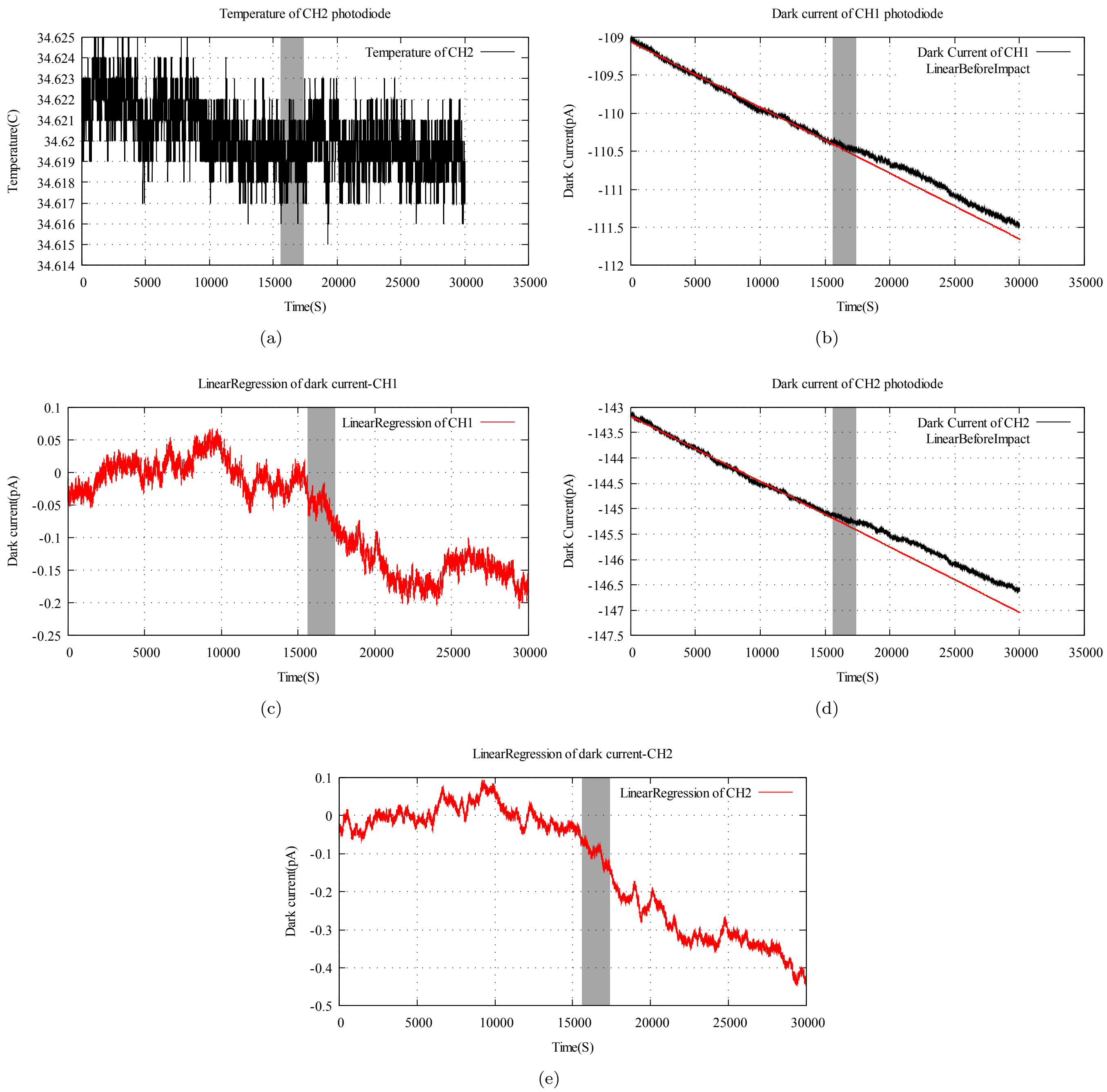


Figure 18. Exp20171011: Non-local test with spinning Poynting vector generator, distance between sensor and generator is 5km, non-local link is the photos of both CH1 and CH2. Grey area means the impact time. Polarization: right-handed. (a) temperature of both channels; (b) data of CH1; (c) linear regression of CH1; (d) data of CH2; (e) linear regression of CH2.

whose type is LM35 was applied to the sensor, which was next to the avalanche photodiode closely. Fig. 24 shows the configuration before it's installed inside. In this configuration, the data of temperature sensor can show the temperature of avalanche photodiode in real time. Fig. 25 shows the result with new configuration, great correlation can be acheived, but from the (c) of Fig. 25, we can see the temperature of sensor is in a linear state. The current changes obviously and instantly at impact time.

IV. Disdussion and Conclusion

In the [1], Serge Kernbach introduced many approaches for detecting torsion field or "high-penetrating" emission, semiconductor-based sensor is one of the effective approaches. In the [7], Claud Swanson introduced the content of torsion field in the 7th and 8th chapter, it says that the torsion field can influence the output of photocell, the right-handed torsion field can decrease the output of photocell, but the left-handed torsion field can increase the output of photocell. In fact, the principle of photodiode

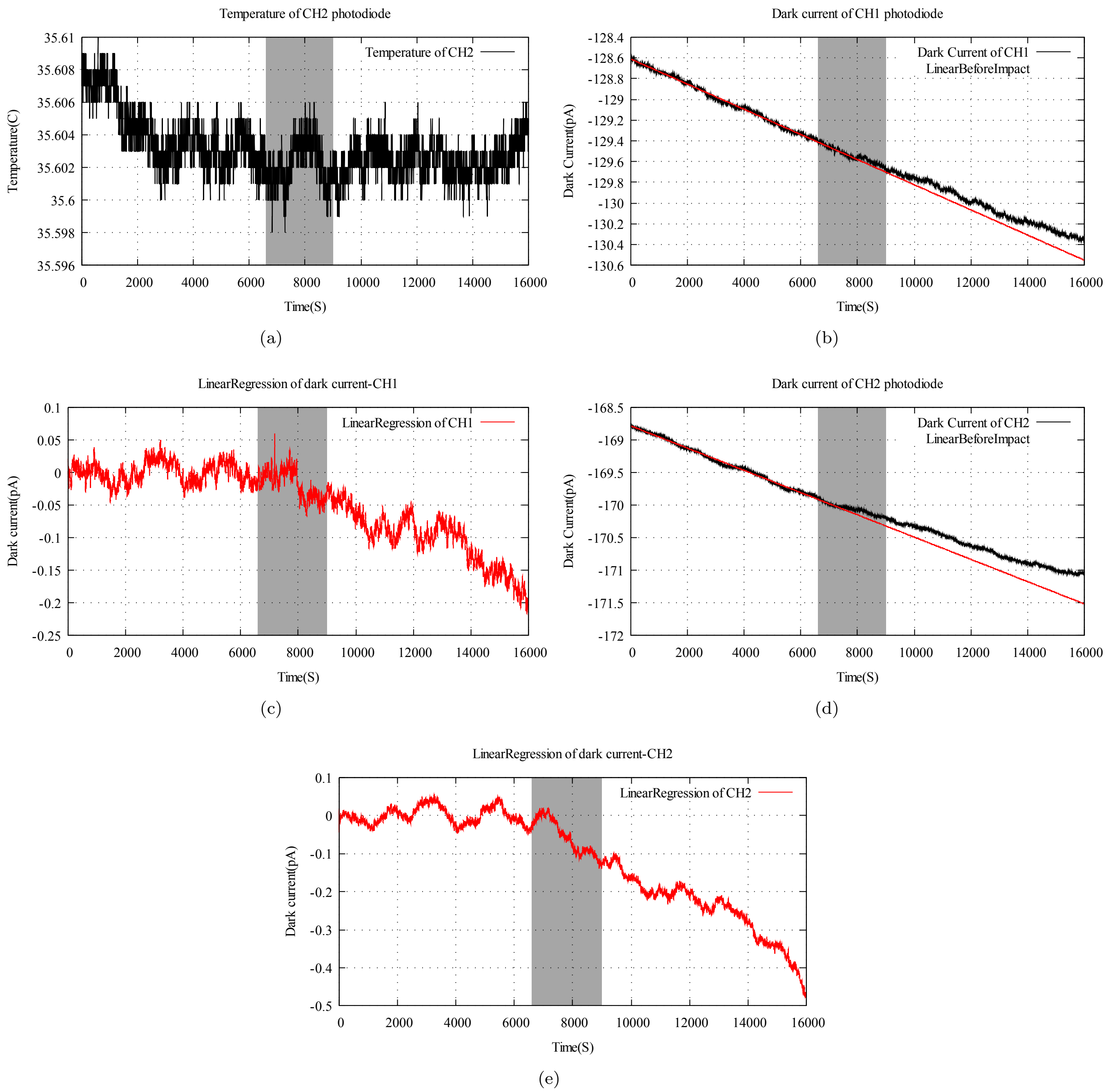
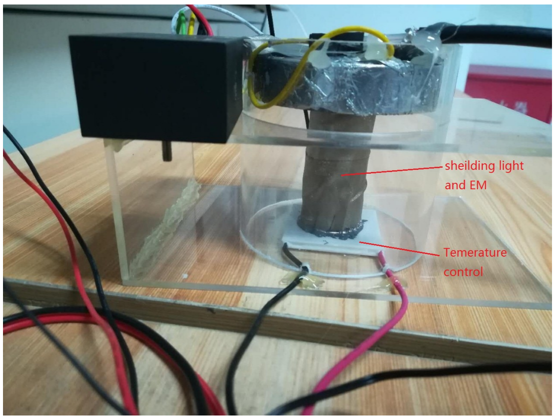


Figure 19. Exp20171013: Non-local test with spinning Poynting vector generator, distance between sensor and generator is 5km, non-local link is the photos of both CH1 and CH2. Grey area means the impact time. Polarization: right-handed. (a) temperature of both channels; (b) data of CH1; (c) linear regression of CH1; (d) data of CH2; (e) linear regression of CH2.

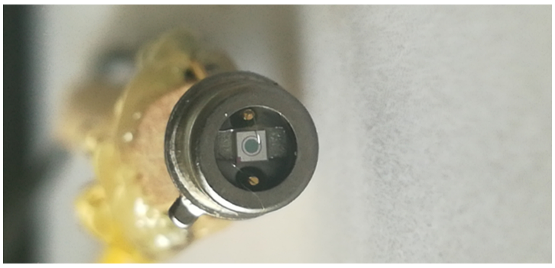
is the same with photocell, they are all based on silicon semiconductor. In the movement of Somatic Science in China in the last century, Prof. Nianlin Zhu in the Yunnan University developed a sensor based on the photodiode, this sensor could react to the specific radiation from the operator's palm in the experiments of Finger Literacy.

The information above all points to the semiconductor-based sensor. So in fact, this work can also be considered as a replication of this approach examined by different generators. But this work is still not enough, because this sensor should also be examined by human operator with ESP ability. A preliminary conjecture is that the nature of the specific radiation from the operator's palm in Prof. Nianlin Zhu's experiments is the torsion field. If the same sensor is used in both device-device and operator-device experiments, the results can be analyzed with a same standard to find out the correlation.

There are many types of photodiodes can be choosed, only some brands are used in this work. HAMAMATSU is a famous brand in the field of photoelectric technology. It should be specially noted that there is different performance when the photodiode works in different range



(a)



(b)

Figure 20. (a) is the whole sensor system with thermostat and high-voltage power; (b) is the avalanche photodiode installed inside.

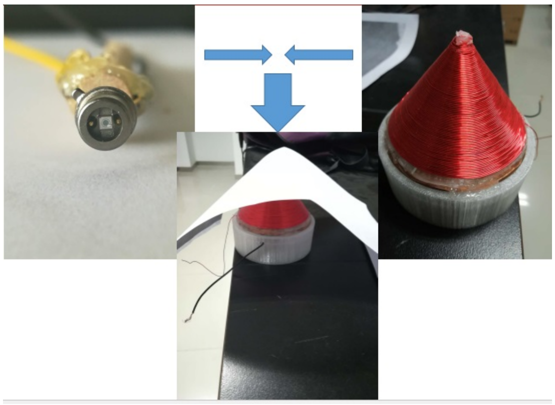
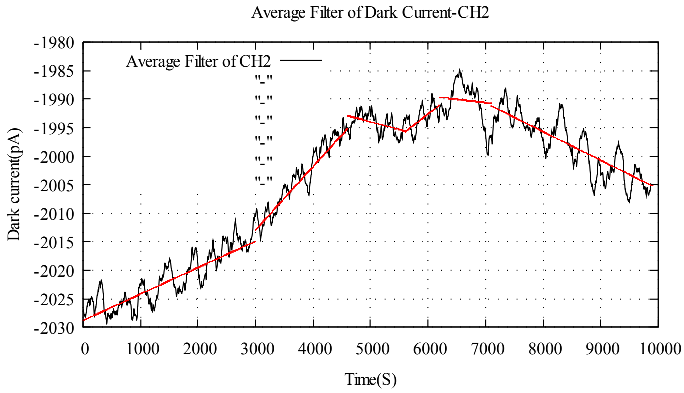
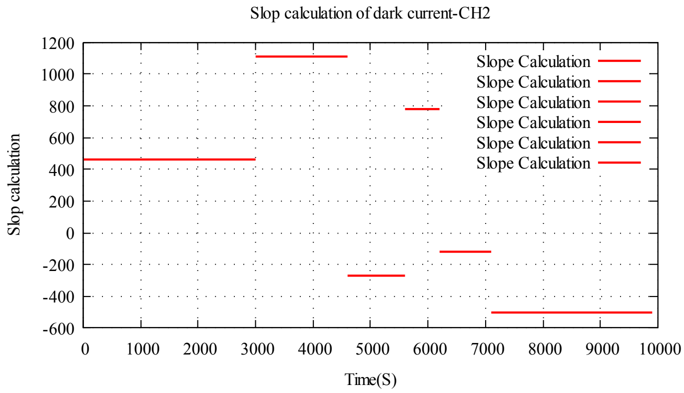


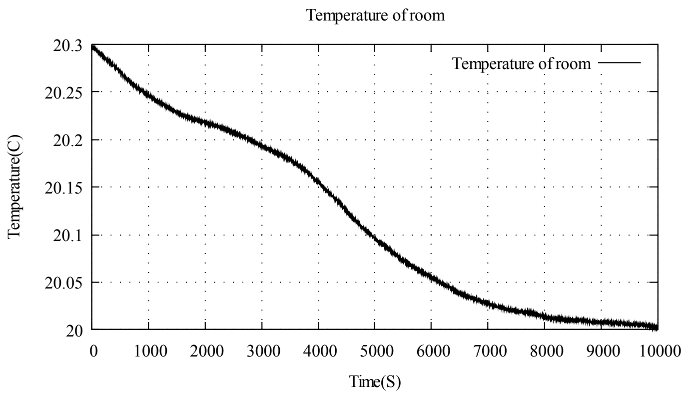
Figure 21. The configuration on the transmitter side.



(a)



(b)

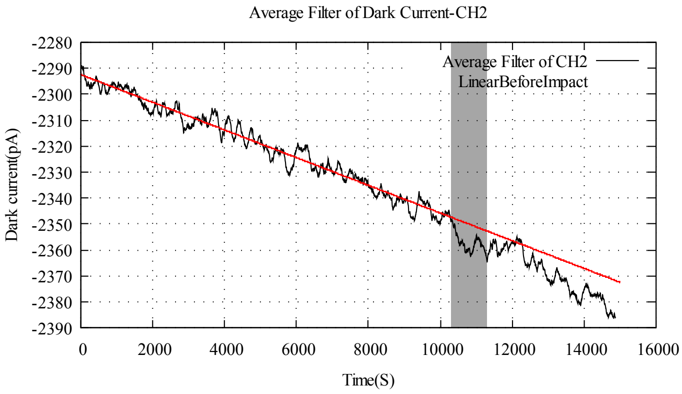


(c)

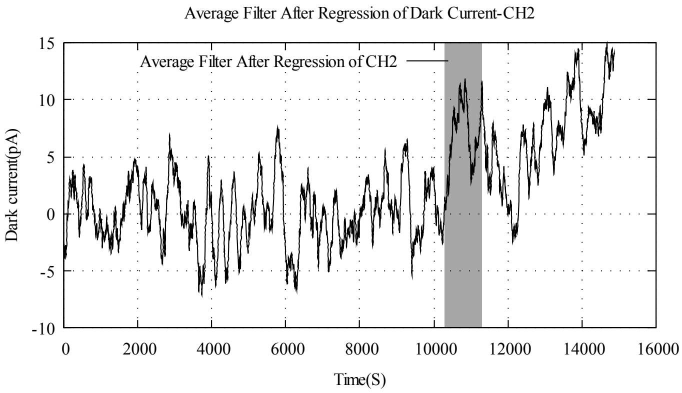
Figure 22. Exp20171206: Non-local test on the avalanche photodiode with spinning Poynting vector generator, distance between sensor and generator is 5km, non-local link is the photo of avalanche photodiode. Polarization: please see the protocol. (a) filtered data with 120 points and linear calculation for different parts according to the protocol; (b) slope calculation for different parts according to the protocol; (c) temperature of room;

of current. This can be adjusted through the reverse bias voltage or the temperature of thermostat. According to the acheived results, it seems that the avalanche photodiode is more sensitive than normal photodiode. Almost in all the experiments with avalanche photodiode, the rate of change is higher and the reaction time required is also more shorter. Almost all the results are changing instantly. And in the original data of avalanche photodiode, the noise is usually very high, this is an advantageous phenomena, because the sensitivity is also very high with high noises. But the disadvantage is the signal-to-noise ratio is low. It seems that the EDL sensor also shows this property, EDL will be more sensitive after entering a oscillation mode [5].

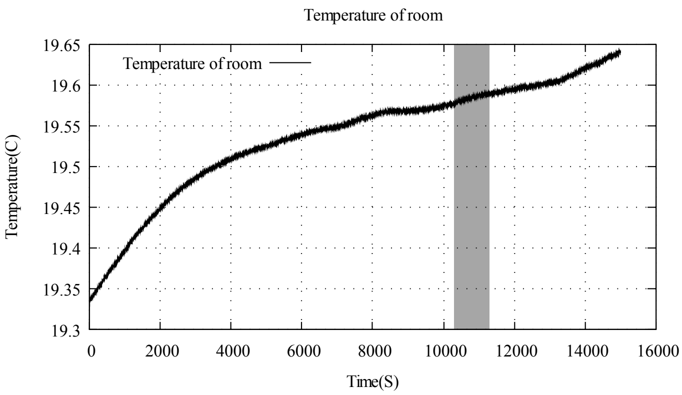
Another phenomena is that the reaction of sensor in non-local experiment with the impact of same polarization of torsion field is not the same for every time. For example in Fig. 22, the reaction of the sensor is "up" with the polarization of right-handed; but in Fig. 23 and Fig. 25, the reaction of the sensor is "down" with the polarization of right-handed. This is absolutely different with the local



(a)



(b)



(c)

Figure 23. Exp20171209: Non-local test on the avalanche photodiode with spinning Poynting vector generator, distance between sensor and generator is 5km, non-local link is the photo of avalanche photodiode. Grey area means the impact time. Polarization:right-handed. (a) filtered data with 120 points and linear calculation for the part before impact; (b) filtered data with 120 points after linear regression; (c) temperature of room.

tests. It seems that nobody knows what happened between the sensor side and the generator side. This belongs to the entanglement phenomena in macroscopic system, which is not fully clear in theory and experiments. But the potential use of this phenomena is infinite and significant.

Based on the experimental results and analysis, we can conclude as follows:

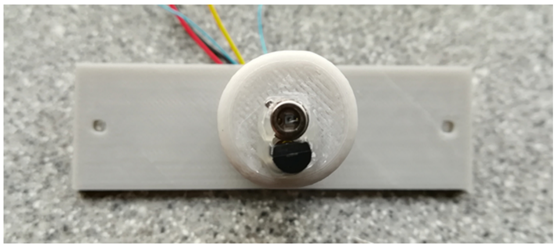


Figure 24. The configuration of temperature sensor inside.

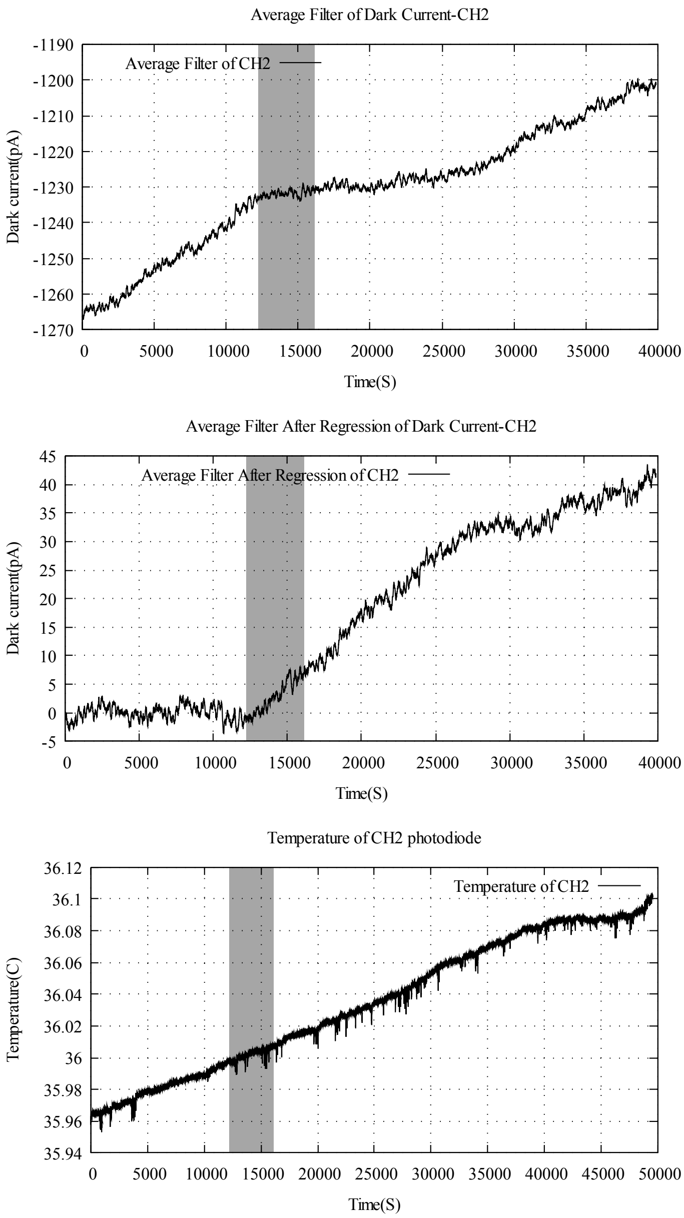


Figure 25. Exp20180504: Non-local test on the avalanche photodiode with spinning Poynting vector generator, distance between sensor and generator is 5km, non-local link is the photo of avalanche photodiode. Grey area means the impact time. Polarization: right-handed. (a) filtered data with 120 points; (b) filtered data with 120 points after linear regression; (c) temperature of room;

- This work provides strong evidence that the approach based on measuring the dark current of silicon photodiode can be used to detect torsion field.

- In most of the results, the sensor reacts to the impact instantly. So there is a potential use of this sensor for the communication purpose or remote control purpose. For example, some important equipment can be controled through this approach remotely ignoring the electromagnetic interference.
- The avalanche photodiode is more sensitive than the normal photodiode under specific condition.

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References

[1] Serge Kernbach. On metrology of systems operating with 'high-penetrating' emission. *International Journal of Unconventional Science*, 1(2):76–91, 2013.

[2] М. Кринкер. Инфо-индуцированные фазовые переходы и уменьшение энтропии объекта. *Журнал Формирующихся Направлений Науки*, 2(1), 2014.

[3] S. Kernbach and O. Kernbach. On precise pH and dpH measurements. *International Journal of Unconventional Science*, 5(2):83–103, 2014.

[4] А.В. Бобров. Реакция двойных электрических слоев на воздействие торсионного поля. - М., 1997. 26 с. Деп. в ВИНИТИ N 1055-В97.

[5] Serge Kernbach. Replication attempt: Measuring water conductivity with polarized electrodes. *Journal of Scientific Exploration*, 27(1):69–105, 2013.

[6] В.А. Жигалов. Характерные эффекты неэлектромагнитного излучения. *Интернет публикация*, 2011.

[7] Claude Swanson. Life force, the scientific basis, 2011.

[8] Gao Peng. Attempts to detect the torsion field nature of scalar wave generated by dual tesla coil system. In *Torsion fields and information interactions - 2016: Materials of the V-th International Scientific and Practical Conference*, pages 258–270, 2016.

[9] Victor Shkatov and Vitaliy Zamsha. Torsion field and interstellar communication, 2015.

[10] A.A. Shpilman. http://spinfield.idhost.kz/ALMANACH/N3_95/S4_1a.htm.

[11] А.В. Бобров. Модельное исследование полевой концепции механизма сознания. - ОрёлГТУ, 2007.

[12] А.В. Бобров. Исследование неэлектромагнитного компонента излучения квантовых генераторов. *ВИНИТИ. Деп №*, 2001.

[13] B.I. Petrovsky A.E. Akimov and V.J. Tarasenko. Structure and construction of torsion generators, pre-pring N52 (rus). *M.,MNTC VENT*, 1995.

[14] С. Кернбах, А. Кернбах, А. Русанов, И. Волков. Анализ детектора Охатрина и малого генератора Акимова. *Журнал Формирующихся Направлений Науки*, 3(9), 2015.

[15] Serge Kernbach. Tests of the circular Poynting vector emitter in static E/H fields. *International Journal of Unconventional Science*, E2:23–40, 2018.

[16] Сергей Кернбах, В.Т. Шкатов, В. Замша. Отчет о проведении экспериментов по сверхдальней связи с использованием цифрового отображения планеты Марс. *Журнал Формирующихся Направлений Науки*, 1(2), 2013.

[17] Anatolii Pavlenko. Possible ways to neutralize biopathogenic radiation. *International Journal of Current Research*, 2017.