Atmospheric Current: Practical Experiments

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The Article describes some experimenters that prove the mysterious current from the Broom Antenna

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The article is described my experiments to measure "atmosphere current" (see **Reference 1**).At first I tried to measure the current at field conditions. For antenna mast I have used a telescopic plastic fishing tackle in 7 meters long. Broom was made from opened multistrand cable. Branches of the broom had length in 10 centimeters. Grounding was made from a steel rod in diameter of 4 millimeter and length in 50 centimeters.

The experiment was made in a forest at a wide glade. It was good calm weather. A thin wire is going from the broom to the digital multimeter M830B, another wire from the multimeter is going to the ground. Multimeter was installed at scale "200 mV". At the scale the multimeter has input impedance 1 million Ohms, so, the maximum measurement current is 200 nano A. However, the multimeter has digits at scale that show 0.1-nano A.

It was discovered no any current. A weak sensitivity of the multimeter may be the reason. However, another phenomenon was discovered. At swing of the fishing rod (with broom) that is usual matter at the experimenters, the multimeter shows current. The current reached up to 10 nano A and changed by amplitude and polarity.

I tried to count the current. The speed of a flow of ions is equal to mobility of ions multiplied by intensity of E- field. The mobility of negative ions (***on Chizhevsky***) under normal atmospheric conditions is equal 1,83 centimeter /second, and intensity of an atmospheric static field - about 1,3 V / centimeter. So, speed of flow of ions ***V*** near 2,5 centimeter/second.

Density of flow of ions ***j = nVe***. Concentration ***n*** of ions at natural conditions is estimate equal near 1000 on cubic centimeter, charge of an ion ***e = 1,6.10-19 ql***. So, ionic current near ground is near about 4 pico A/square meter, that is not practically matched with some data found by me in technical reference- near 2,5 … 3,5 pico A/ square meter.

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It is less of the sensitivity of the multimeter in 10-100 times.

At the same time we may assume, that grounded (through the digital multimeter) antenna creates around of it's end top a volumetric charge with a zero potential relative to the ground.
Moving fast (faster than ions can move) the broom antenna end from one air area (that almost has potential of the broom) to other air are (that has potential ***U*** near 1000 V relative to the ground- 130 V (electrical gradient) multiply to 7.5 meters (height of the fishing rod)) is caused recharge current ***i*** for the antenna. Let's find the current.

I= dq/dt,

Where: ***q= CU.***

Assume that antenna has ***C= 20 pF*** and time of antenna moving- ***1 second***. So, antenna current would be ***20 nano-A***, that the multimeter is shown to us.

Conclusion 1: Although I cannot measure the antenna current at the field conditions the experiment prove the electrization of the air around the antenna broom.

Other experiment I made in summer, in hot weather (+28 C) at weak wind. Broom was made from a steel wire rope. The rope contained 49 steel wires, I untwisted the rope in length near 20 centimeter.

Figure 1 shows my “Broom- Rope Antenna.”

Figure 1 Broom- Rope Antenna from the untwisted rope

Broom was fixed on the end of the 7-meter fishing tackle, end of this one was fixed to a dry pine pole. The mast of 12 meters length was fixed to the bungalow, so the Broom Antenna was at 9 meters over grounded metal roof**. Figure 2** shows the design.

A thin insulated wire was going from the Broom to the “plus” of the multimeter, “minus” of the multimeter was connected with the ground. A capacitor 4-mkFx250-V having very low leaking was connected to bridge to the multimeter probes. The capacitor shunts RF and filters fast fluctuation of the antenna current. Now the antenna current was measured for sure. The current was +0.15 nano-A at with some unexpectedly big fluctuations. Several hours of measurement showed that max current was several nano-A (**Figure 3**). Sometimes the current changed the polarity, I observed minus 0.3 nano-A. The antenna current fluctuations may be caused by wind that moves air areas with different volumetric charge around Broom Antenna.

Figure 2 Broom Antenna in the night sky

Conclusion 2: Current from the Broom to the antenna wire is existed and prove the “quite” discharge from ends of broom wires. The current is very unstable by amplitude and may change polarity at clear weather. Ever simple digital multimeter can measure the current.

There are no doubts that “quiet” discharge has an area with a negative resistance. It is possible to find lots data about it in the Internet. **Figure 4** (taken from **Reference 2**) shows a Volt/ Ampere diagram of such discharge. Almost the same diagram you may find at **Reference 3**.

Take attention that at the left area there are nano-Ampere current area. It is so-called “quite” or Townsend’s discharge. At right area (arc discharge) there are current at several Amperes. Both areas have parts with a negative resistance. Nano-area begins from current near 100- nano- Ampere. However the current depends on lots conditions…

My experimenters (made in 2000- 2001 years) proved that discharge may began at relative low voltage and enough large distance between electrodes (see ***Reference 4***). I did the experimenters at my table so I do not know how discharge would be flow at a Broom Antenna. At the experimenters I was observed relaxation oscillations. The oscillations were detected by the help of oscilloscope. It may be detected by ear like weak hissing. Townsend was observed this phenomenon at 20- 30s of the 20- century.

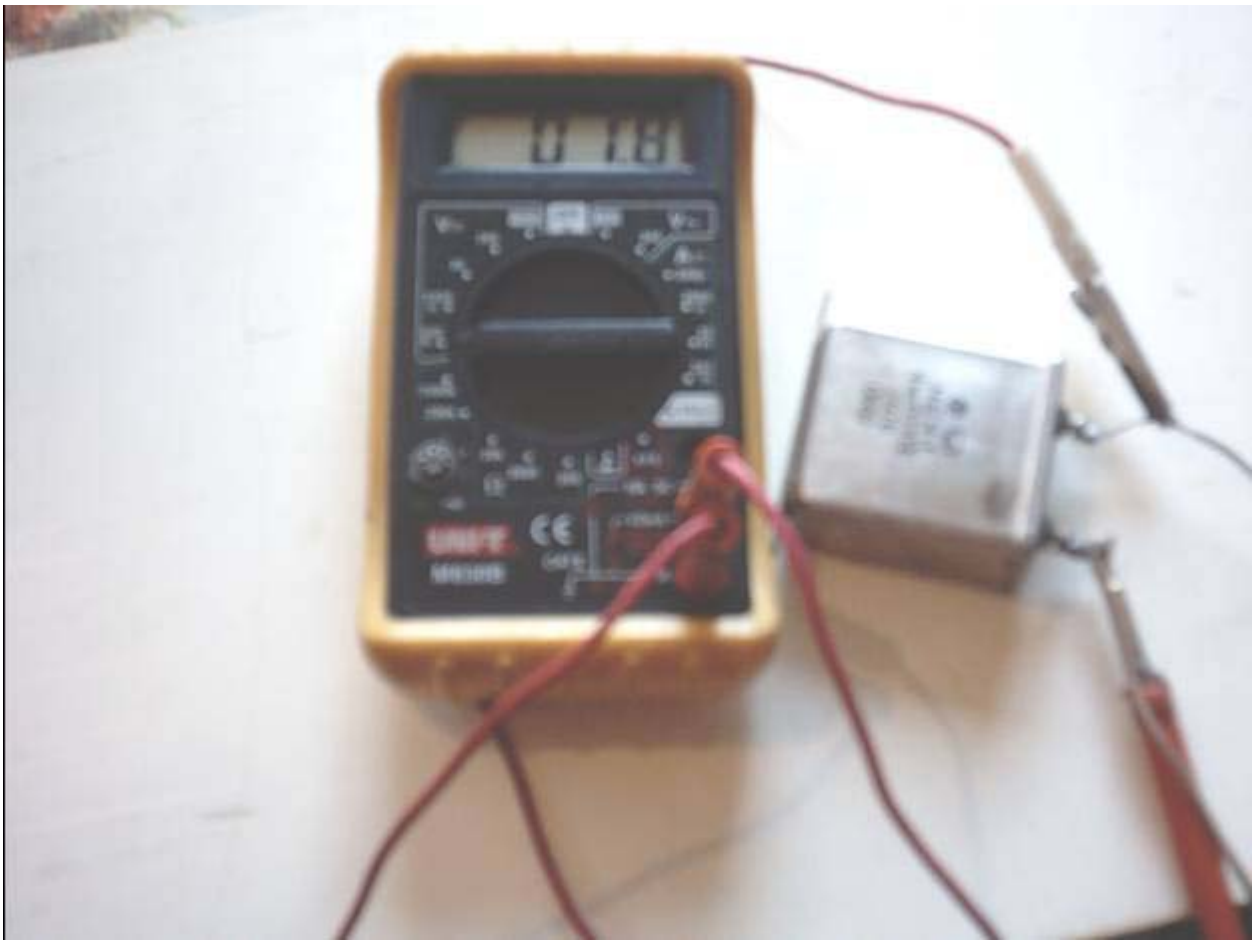

Figure 3 One of the maximum of the Antenna Current

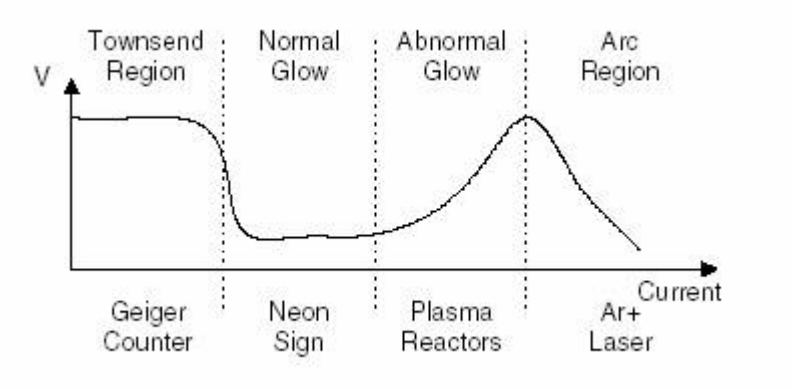

Figure 4 Volt/Ampere diagram of air discharge.

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Recently I have repeated these experiments to find the top frequency of the discharge generation. I switched on in the circuit of a discharge needle, (also I have tried a small broom made from thin wires) different LC- circuits. It was easy to obtain generation at 1-MHz. But I managed to get generation up to 5-MHz. However, I believe it is possible to get generation above 5-MHz.

The Broom Antenna was tested with a detector receiver. This receiver with a LW antenna (12- meters, 45° above the ground) provided 1.5-V across a high-ohmic phones (day time, broadcasting Russian radio station Mayak, 549 –kHz, the station was located at 28-km from my Broom Antenna). Vertical Broom Antenna (that was described above) provided 4.5-V across the high-ohmic phones. I do not insist that it was caused by "amplification" of the Broom Antenna, but… No any fluctuations at receiving were detected with the Broom Antenna.

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To prove the efficiency of the Broom Antenna more experimenters are needed to do. Very useful would be experimenters with receiving very weak signals- nano and pico- Watts in power. However it needs to use at the experimenters receivers with high-resistance antenna input because the Broom Antenna has extremely high output resistance- may be Giga and ever Tera- Ohm.

Be Careful! Experimenters with high-ohmic antennas that may do ionization of the air are extremely dangerous at any (and especially at storm) weather. Any experimenters with the Broom Antenna you are doing at your own risk!

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