#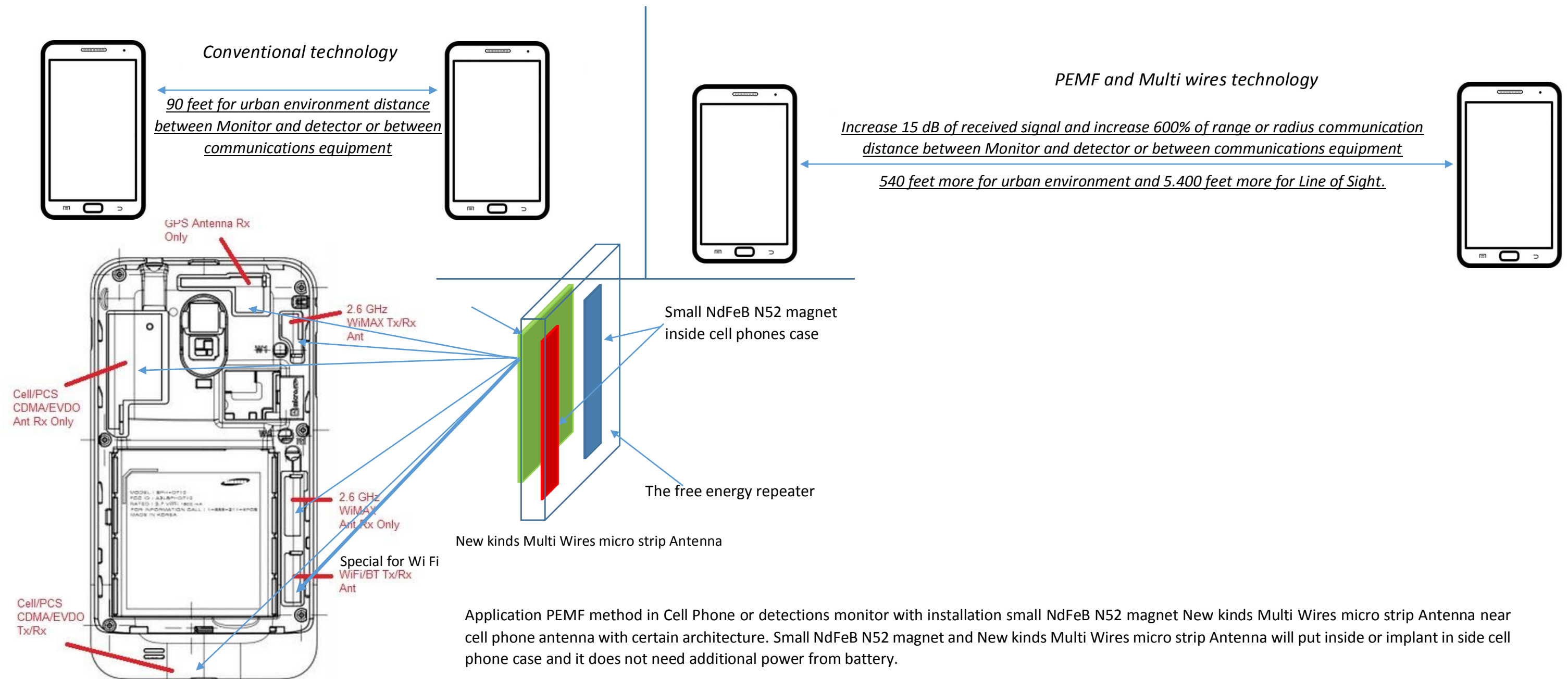 Innovation PEMF (Potential Electro Motion Force) to increase antennas sensitivity and increase reliability and range communication and detection

Abstract

With assume wireless network and any terrestrial structure in communication and detection. PEMF and Multi wires Method is new innovation novel technology that increase reactivity electron move and increase quantity electron flow in electromagnetic induction that increase sensitivity of antenna in detection and communications. With use point to point detection and communication with increasing range or radius detection and communication and increase signal quality of all kinds of facilities or all kinds of application programs with PEMF and Multi wires method, this technology is compatible and directly attach to cell phone, HT and other detections monitor.
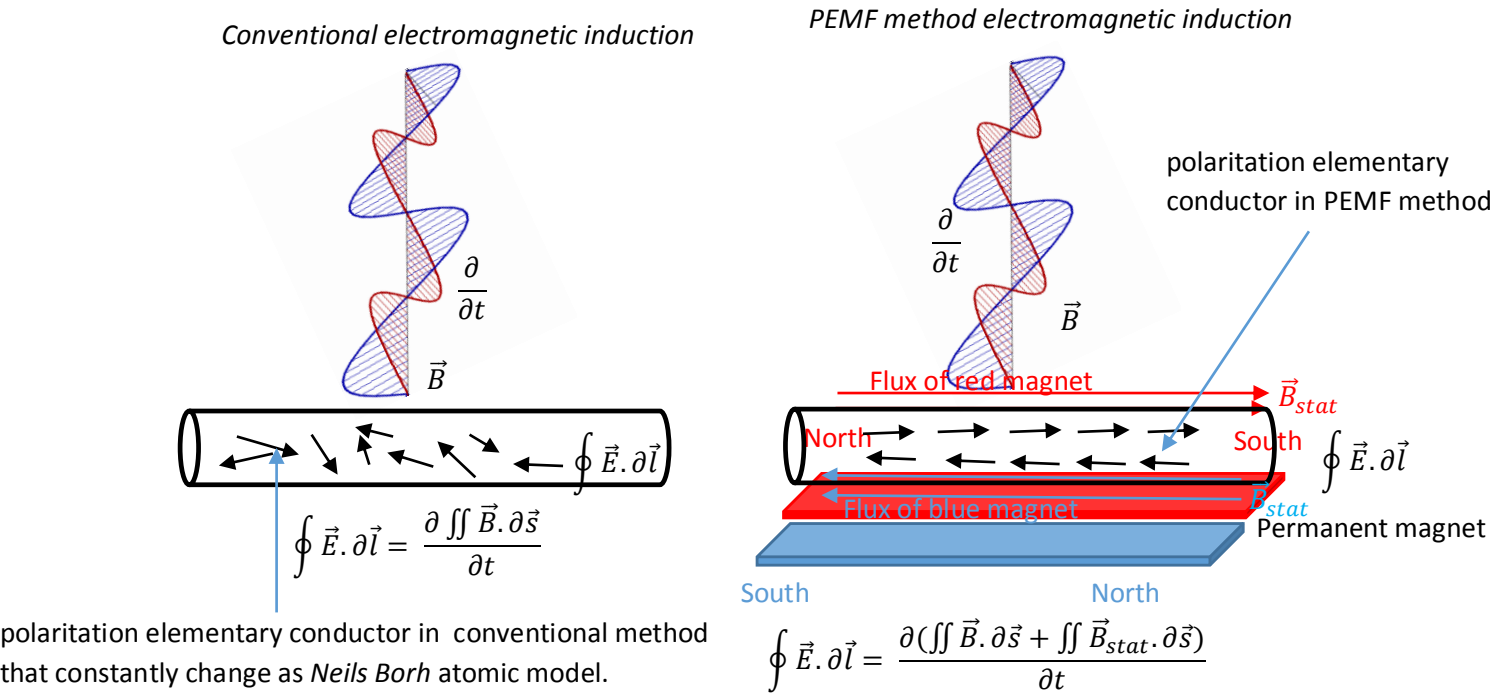
PEMF and Multi wires method also increase signal quality and radius communication for disaster recovery communication and for normally cellular communication with install it in cell phones case directly and it will not increase dimension of cell phone and will not use additional input power so will not use battery power. Leading in technology, ease to applicate for unlimited user, low cost production and reliable.

Increase range communication and detection Wi-Fi point to point call with PEMF method with use Cell phone as detection monitor or as communications equipment

Conventional technology

90 feet for urban environment distance between Monitor and detector or between communications equipment

PEMF and Multi wires technology

Increase 15 dB of received signal and increase 600% of range or radius communication distance between Monitor and detector or between communications equipment

540 feet more for urban environment and 5.400 feet more for Line of Sight.

GPS Antenna Rx Only

2.6 GHz WiMAX Tx/Rx Ant

Cell/PCS CDMA/EVDO Ant Rx Only

2.6 GHz WiMAX Ant Rx Only

Special for Wi Fi WiFi/BT Tx/Rx Ant

Cell/PCS CDMA/EVDO Tx/Rx

Small NdFeB N52 magnet inside cell phones case

The free energy repeater

New kinds Multi Wires micro strip Antenna

Application PEMF method in Cell Phone or detections monitor with installation small NdFeB N52 magnet New kinds Multi Wires micro strip Antenna near cell phone antenna with certain architecture. Small NdFeB N52 magnet and New kinds Multi Wires micro strip Antenna will put inside or implant in side cell phone case and it does not need additional power from battery.

Innovation PEMF (Potential Electro Motion Force) and Multi wires to increase antennas detection and communication technology

Static magnetic induction increase reactivity electron to move by dynamic magnetic induction in conductor. Parallelism atomic conductor (elementary magnet) increase different potential by increasing reactivity electron to move. Electro motion force in conventional electromagnetic induction is potential different in random polarity of atomic conductor while in PEMF method electro motion force is potential different in bidirectional polarity of atomic conductor. Illustrating below is electromagnetic induction in conventional and PEMF method with additional component of formula.

Conventional electromagnetic induction

PEMF method electromagnetic induction

polaritation elementary conductor in PEMF method

$\frac{\partial}{\partial t}$

$\vec{B}$

Flux of red magnet

$\vec{B}_{stat}$

North   South

$\oint \vec{E}.\partial\vec{l}$

Flux of blue magnet

$\vec{B}_{stat}$

Permanent magnet

South   North

$$\oint \vec{E}.\partial\vec{l} = \frac{\partial(\iint \vec{B}.\partial\vec{s} + \iint \vec{B}_{stat}.\partial\vec{s})}{\partial t}$$

$\frac{\partial}{\partial t}$

$\vec{B}$

$\oint \vec{E}.\partial\vec{l}$

$$\oint \vec{E}.\partial\vec{l} = \frac{\partial \iint \vec{B}.\partial\vec{s}}{\partial t}$$

polaritation elementary conductor in conventional method that constantly change as *Neils Borh* atomic model.

Electromagnetic signal that comes from transmitter (Transmission) or reflected signal

$$\vec{B} = \mu.\vec{H}$$

Conventional Antenna as receiver

North

South

Electromagnetic signal that comes from transmitter (Transmission) or reflected signal

$$\vec{B} = \mu.\vec{H}$$

North   South

PEMF method Antenna as receiver

Result of Conventional and PEMF antenna receive signal power test

With compare Conventional Antenna and PEMF antenna with 50% level PEMF (1.9*10⁻³ Tesla) with dipole antenna in same parameters.

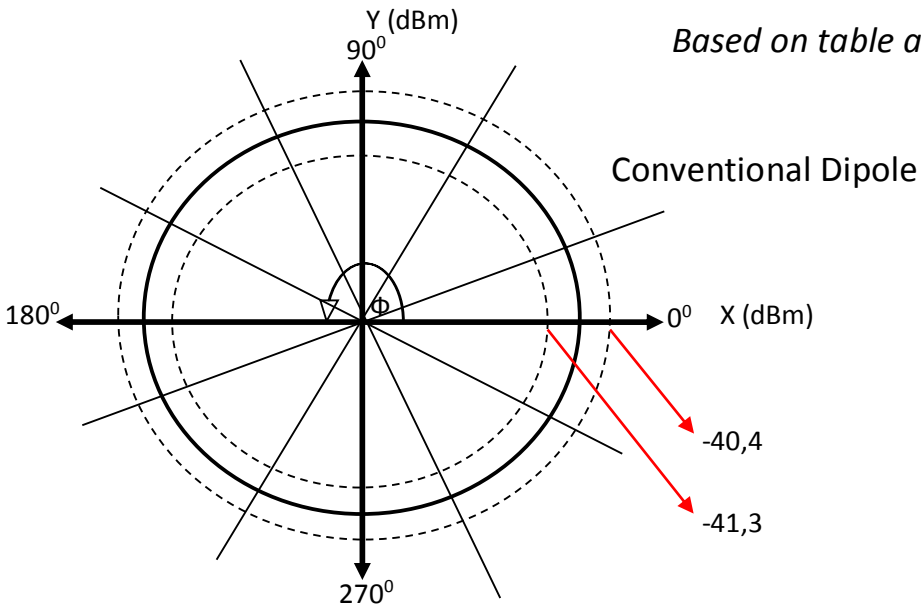| No	Conventional Antenna (dBm)	PEMF Antenna (*50% PEMF*) (dBm)	*Increase of gain* (dB)
1	-41,5	-36,3	5,2
2	-42,6	-36,2	6,4
3	-40,6	-37,2	3,4
4	-40,5	-36,6	3,9
5	-40,6	-36,5	4,1
6	-40,8	-36,1	4,7
7	-40,6	-36,3	4,3
8	-40,7	-36,2	4,5
9	-40,8	-36,2	4,6
10	-40,6	-36,1	4,5
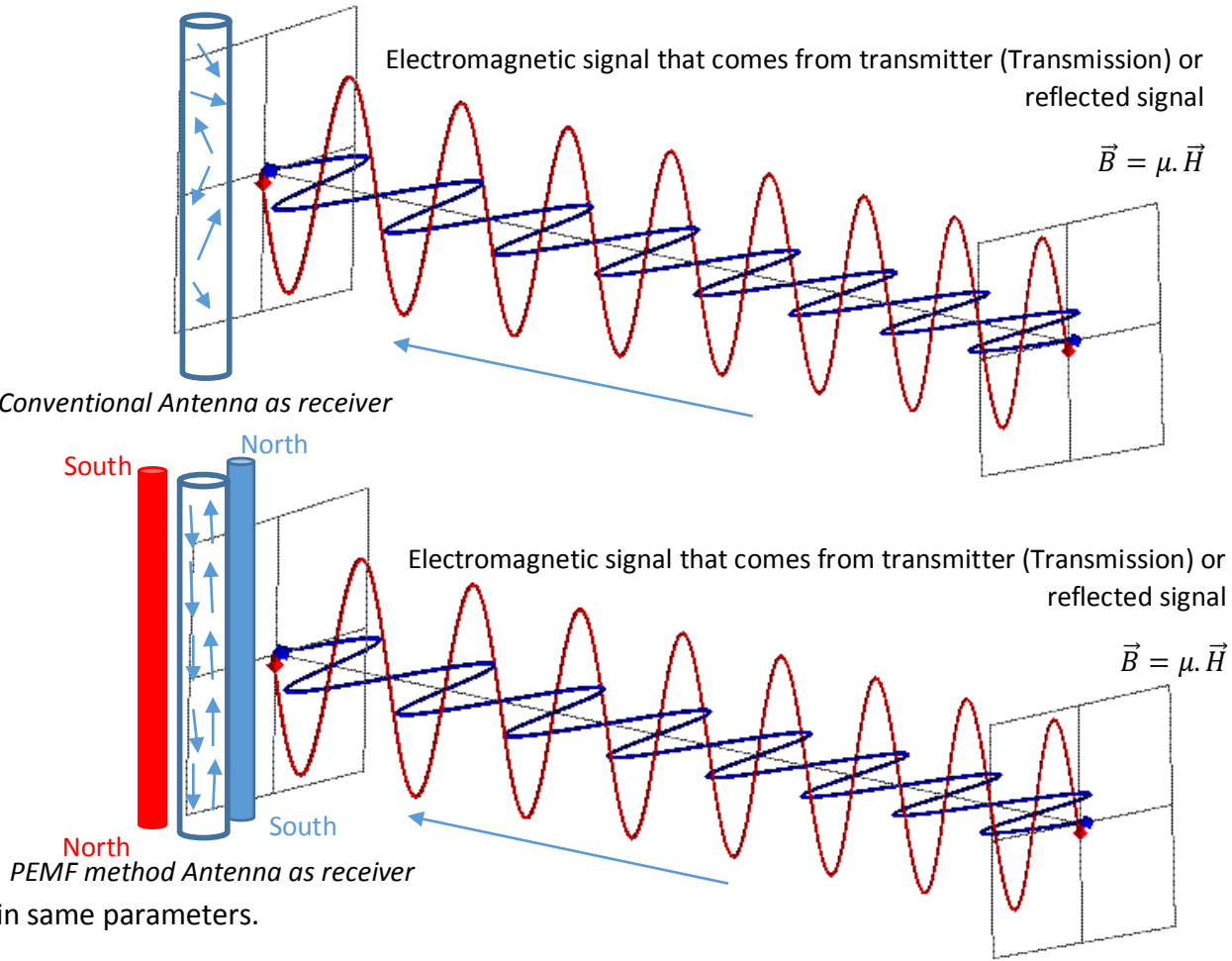
Mean of ten samples of test of prototype : $\frac{\sum_{i=1}^{n} Gi}{n}$

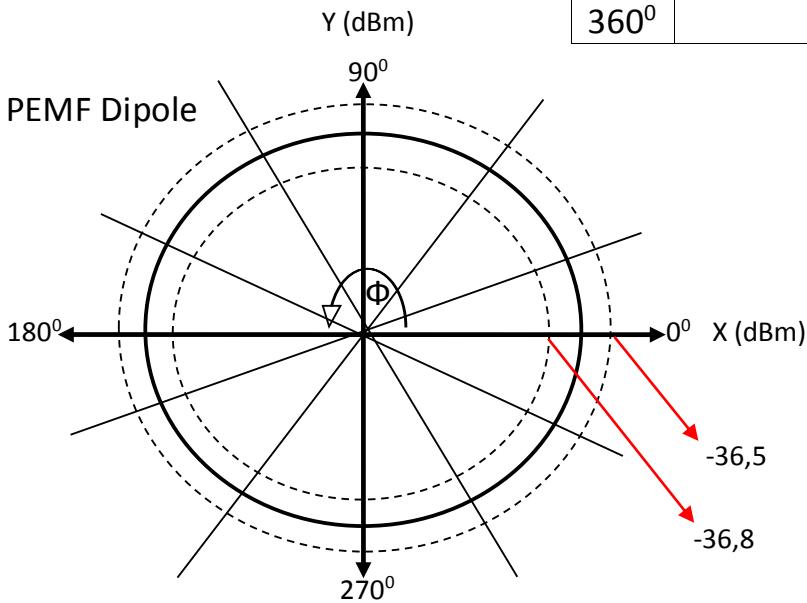1. *Conventional dipole* = -40,93 dBm.

2. *PEMF antenna dipole* = -36,37 dBm.

Gain = PEMF Antenna – conventional Antenna = 4,56 dB

Result of Conventional and PEMF antenna propagation test in $0^0 < \Phi < 360^0$ and $0^0 < \Theta < 360^0$

Φ	Conventional Dipole Antenna (dBm)	PEMF Dipole Antenna (dBm)
0^0	-40,6	-36,6
30^0	-40,6	-36,5
45^0	-40,5	-36,7
60^0	-40,8	-36,8
90^0	-41,3	-36,7
120^0	-40,5	-36,6
135^0	-40,7	-36,7
180^0	-40,4	-36,7
270^0	-40,7	-36,7
360^0	-40,5	-36,8

Θ	Conventional Dipole Antenna (dBm)	PEMF Dipole Antenna (dBm)
0^0	-40,1	-36,3
30^0	-42,8	-37,9
38^0	-43,3	-39,2
45^0	-44,5	-41,1
60^0	-47,6	-43,6
90^0	-52,9	-47,9
120^0	-48,0	-42,6
135^0	-45,7	-38,8
180^0	-54,1	-49,8
270^0	-52,0	-46,8
320^0	-43,2	-39,2
360^0	-40,3	-36,2

Based on table above $0^0 < \Phi < 360^0$

Conventional Dipole

PEMF Dipole

No	Θ	PEMF Dipole (dBm)	Conventional Dipole (dBm)	Δ Power PEMF Dipole Beam width	Δ convention dipole Beam width	Δ Θ	Beam width
1	0^0	-36,3	-40,1	PEMF dipole2 − PEMF dipole1 = 2,9 dB	Dipole2 - dipole1=3,2 dB	$\Theta_1- \Theta_2= 38^0$	$\Delta\Theta_{12} + \Delta\Theta_{34} =78^0$
2	38^0	-39,2	-43,3				
3	320^0	-39,2	-43,2	PEMF dipole4 − PEMF dipole3 = 3 dB	Dipole4 - dipole3=2,9 dB	$\Theta_1- \Theta_2= 40^0$	
4	360^0	-36,2	-40,3				

Conventional Dipole
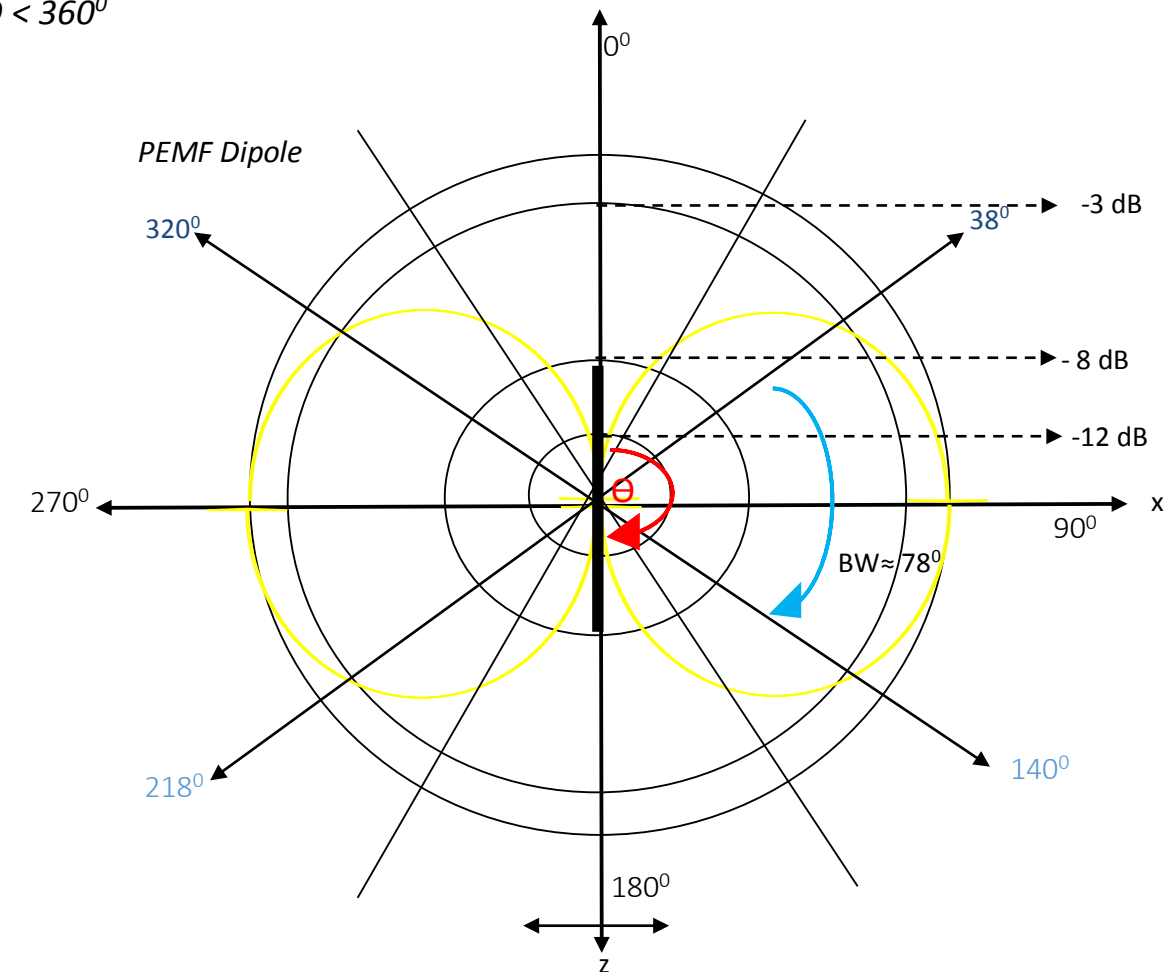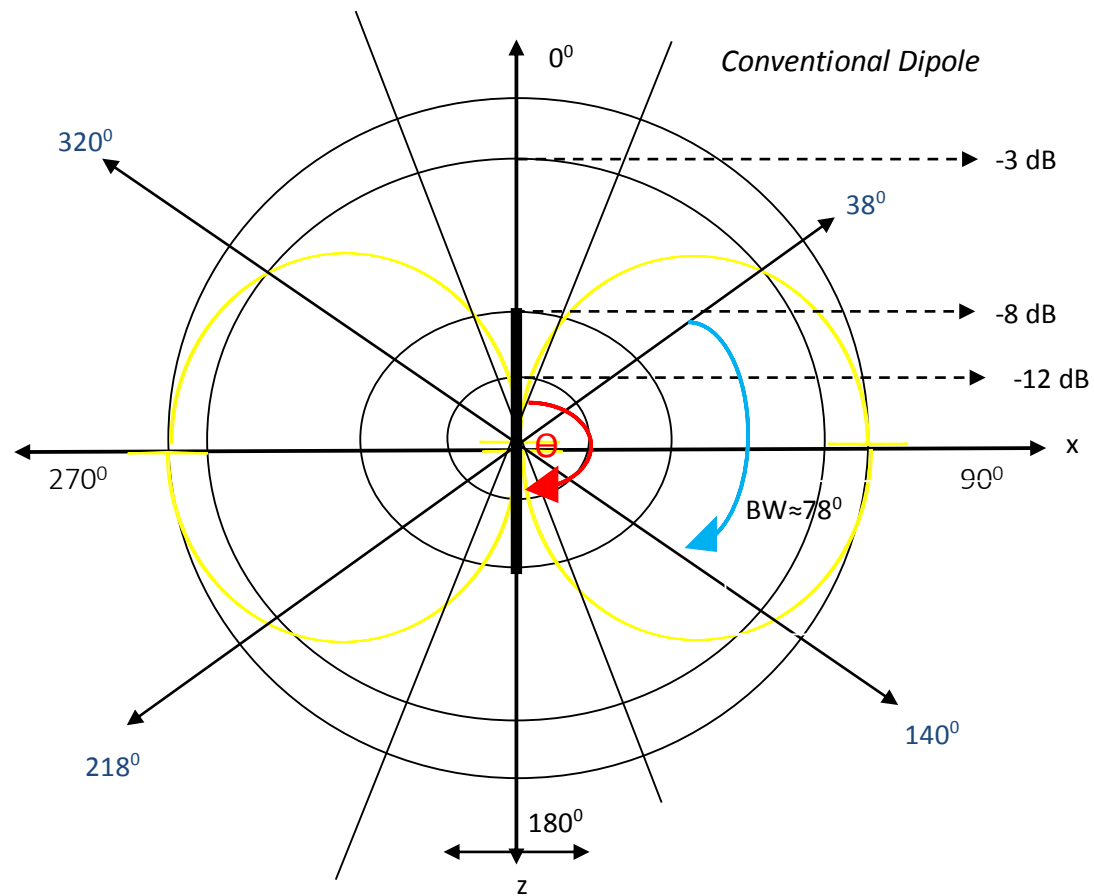
PEMF Dipole

Based on result of test propagation PEMF Dipole antenna has equal form with conventional dipole with 78^0 of beam width so Increasing gain without decreasing of beam width by application magnet are increasing of antennas sensitivity and are not as parasitic component.
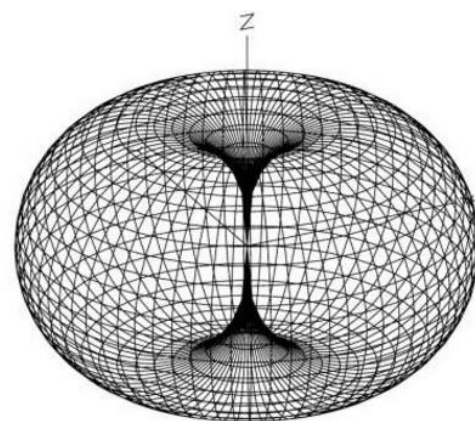
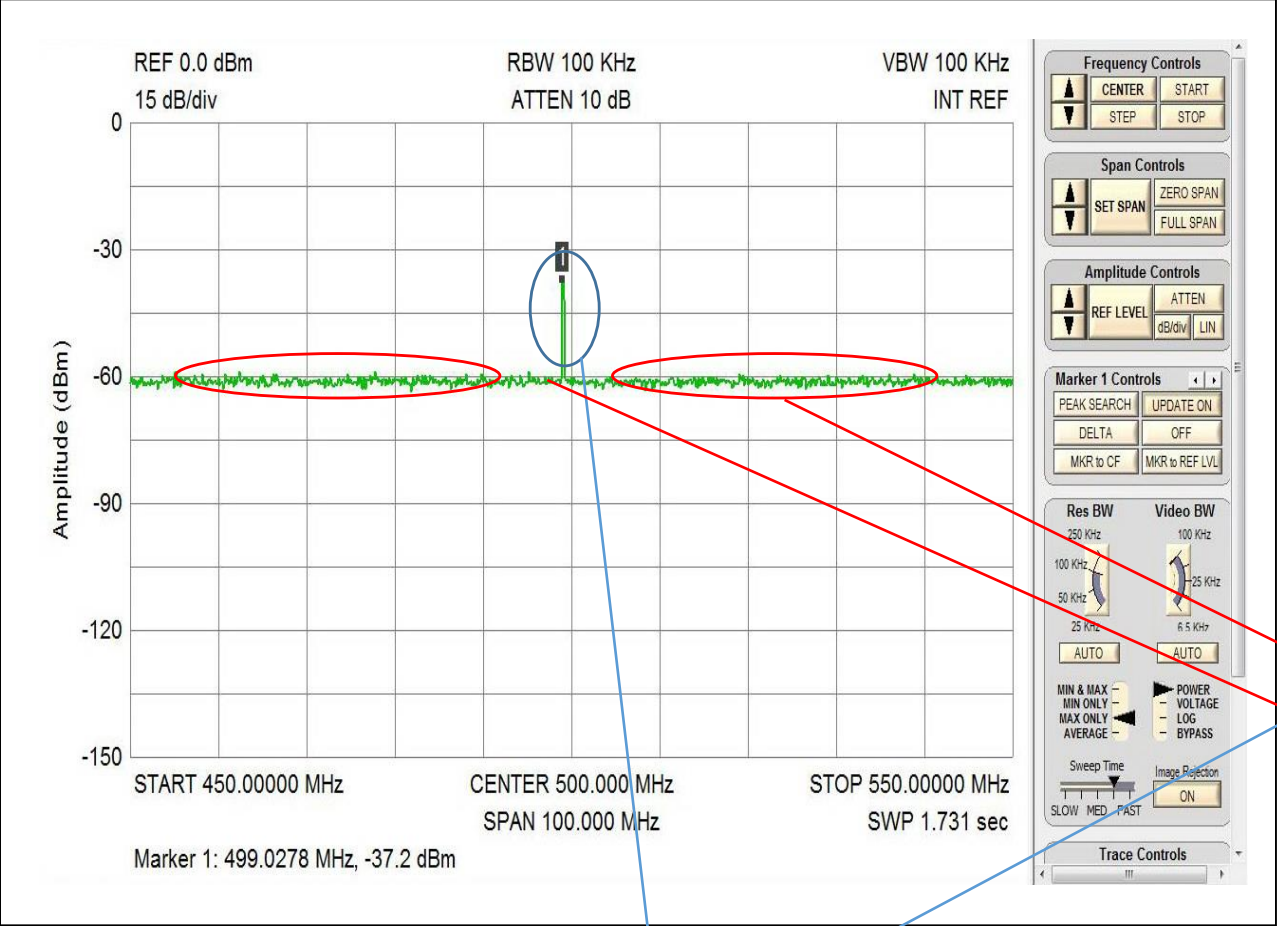*Propagation conventional Dipole receiver antenna*
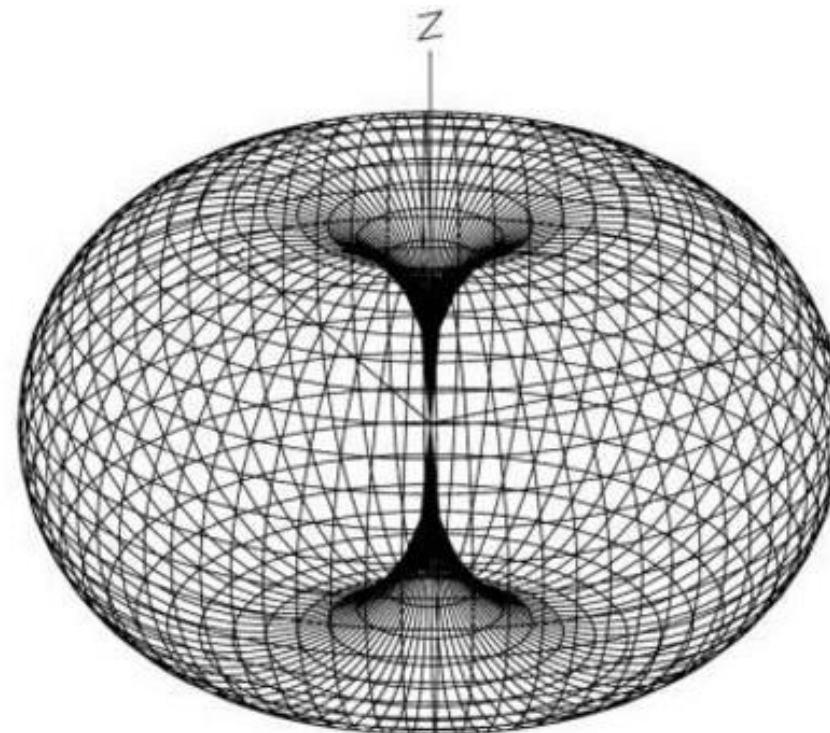
Propagation PEMF Dipole receiver antenna

Illustrating beside describe increase propagation area that can fill by receptor of antenna with applicate PEMF method.

Increasing gain in propagations dipole antenna without decreasing beam width proof of increase of sensitivity by applicate static flux magnet in receptor antenna.

Magnet that put near antenna receptor produce magnetic flux that fill inside of antenna receptor to increase reactivity electron move and not reflected or directed electromagnetic signal (Parasitic component).
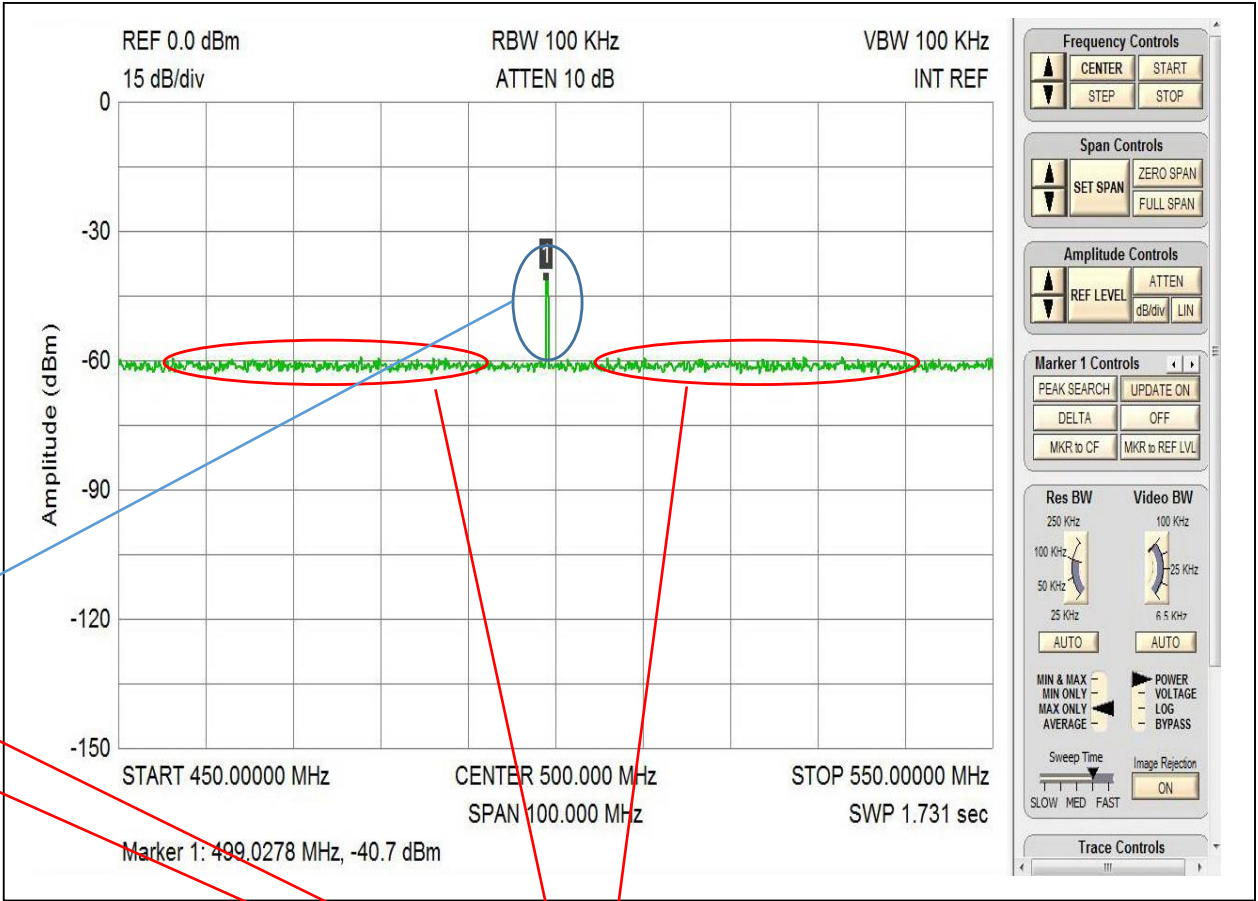
Noise and Increase signal in PEMF method

Left spectrum analyzer display:

REF 0.0 dBm   RBW 100 KHz   VBW 100 KHz
15 dB/div   ATTEN 10 dB   INT REF

Frequency Controls: CENTER | START | STEP | STOP
Span Controls: SET SPAN | ZERO SPAN | FULL SPAN
Amplitude Controls: REF LEVEL | ATTEN | dB/div | LIN
Marker 1 Controls: PEAK SEARCH | UPDATE ON | DELTA | OFF | MKR to CF | MKR to REF LVL
Res BW: 250 KHz, 100 KHz, 50 KHz, 25 KHz, AUTO
Video BW: 100 KHz, 25 KHz, 6.5 KHz, AUTO
MIN & MAX | MIN ONLY | MAX ONLY | AVERAGE
POWER | VOLTAGE | LOG | BYPASS
Sweep Time: SLOW MED FAST
Image Rejection: ON
Trace Controls

START 450.00000 MHz   CENTER 500.000 MHz   STOP 550.00000 MHz
SPAN 100.000 MHz   SWP 1.731 sec
Marker 1: 499.0278 MHz, -37.2 dBm

PEMF Dipole antenna signal received

Right spectrum analyzer display:

REF 0.0 dBm   RBW 100 KHz   VBW 100 KHz
15 dB/div   ATTEN 10 dB   INT REF

Frequency Controls: CENTER | START | STEP | STOP
Span Controls: SET SPAN | ZERO SPAN | FULL SPAN
Amplitude Controls: REF LEVEL | ATTEN | dB/div | LIN
Marker 1 Controls: PEAK SEARCH | UPDATE ON | DELTA | OFF | MKR to CF | MKR to REF LVL
Res BW: 250 KHz, 100 KHz, 50 KHz, 25 KHz, AUTO
Video BW: 100 KHz, 25 KHz, 6.5 KHz, AUTO
MIN & MAX | MIN ONLY | MAX ONLY | AVERAGE
POWER | VOLTAGE | LOG | BYPASS
Sweep Time: SLOW MED FAST
Image Rejection: ON
Trace Controls

START 450.00000 MHz   CENTER 500.000 MHz   STOP 550.00000 MHz
SPAN 100.000 MHz   SWP 1.731 sec
Marker 1: 499.0278 MHz, -40.7 dBm

Conventional Dipole antenna signal received

Signal

Increase of signal happen in apply PEMF method in conventional dipole antenna.

Noise

There is no increasing of noise in application PEMF method. PEMF can applicate directly in detections systems.

PEMF method in transmitter

Transmitter Antenna

Electromagnetic signal that comes from electric signal in transmitter antenna
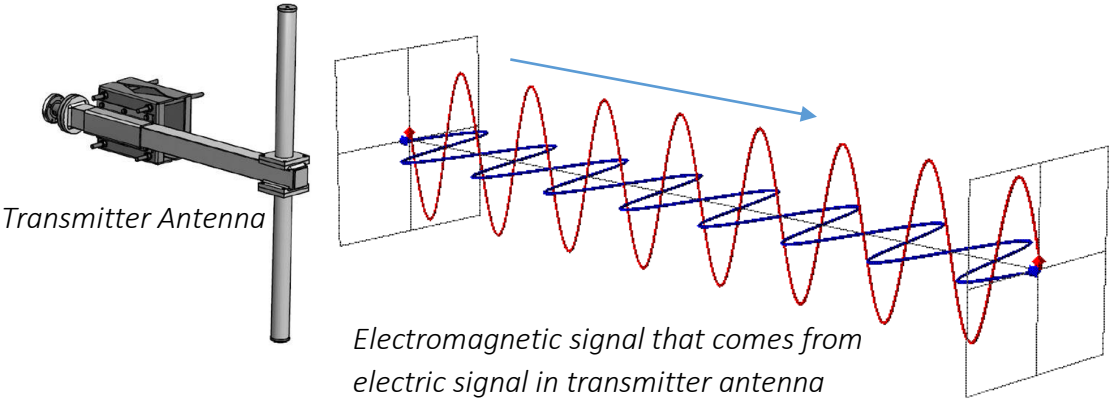
Magnetic signal in electromagnetic waves transmission comes from electric signal in transmitters antenna with equation:

$$\oint \vec{H}.\partial\vec{l} = \int \vec{J}.\partial\vec{s} + \frac{\partial \oint \vec{D}.\partial\vec{s}}{\partial t}$$, H = Magnetic Field   J = Electric Current   D = Electric Displacement
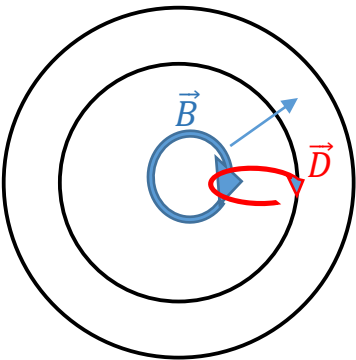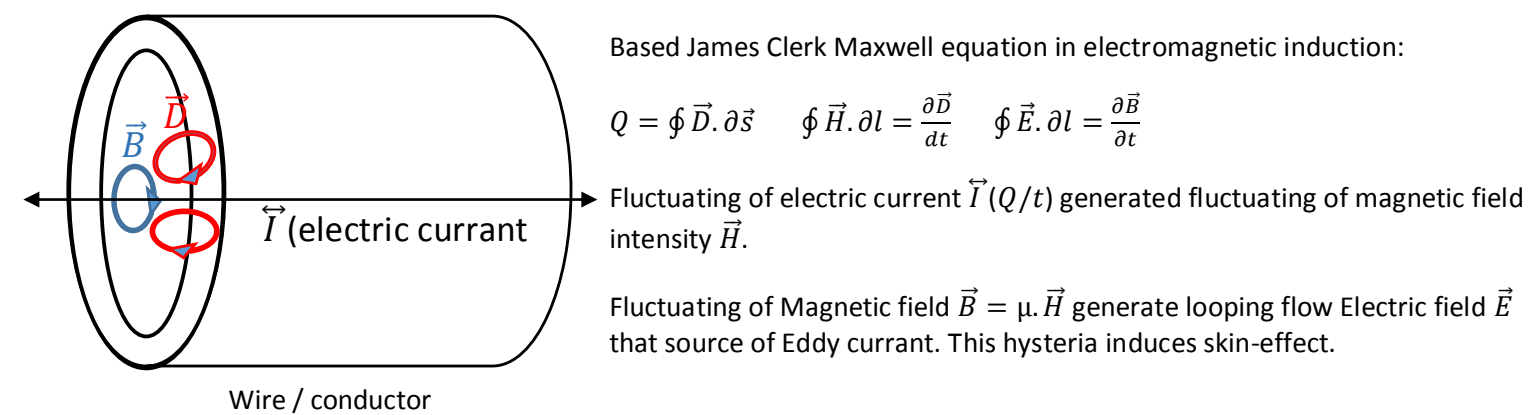
There is no influence with static magnetic flux in All parameters of transmissions equation, so PEMF method in antennas transmitter generate same and equal signal with conventional antennas transmitter.

PEMF method just increase received signal (Increase sensitivity of receivers Antenna) in transceiving electromagnetics signal.

Hysteria of magnetic wave in Multi wires method

Caused of fluctuation frequencies pattern of electric current in wound wire generates Eddy current that push electrons flow to skin area of transducers wire.

Illustration of electric current in wire.

Based James Clerk Maxwell equation in electromagnetic induction:

$$Q = \oint \vec{D}.\partial \vec{s} \qquad \oint \vec{H}.\partial l = \frac{\partial \vec{D}}{dt} \qquad \oint \vec{E}.\partial l = \frac{\partial \vec{B}}{\partial t}$$

Fluctuating of electric current $\vec{I}$ (Q/t) generated fluctuating of magnetic field intensity $\vec{H}$.

Fluctuating of Magnetic field $\vec{B} = \mu.\vec{H}$ generate looping flow Electric field $\vec{E}$ that source of Eddy currant. This hysteria induces skin-effect.

Wire / conductor

Skin effect formula δ (m) = $\sqrt{\dfrac{1}{\pi.f.\mu.\sigma}}$

δ : skin depth (m)   f : frequency of fluctuating current

μ : permeability of wire σ : conductivity of wire

From these phenomena caused electron flow just in surface of wire as illustrated below. Blue dots represent electron flow of electric current.

Multi Wires Method

Both wire have same dimension and have equal load but fluctuating current push all electron moves in surface of wire.

Diameter = X

Diameter = X

DC currant / flat current

Fluctuating current
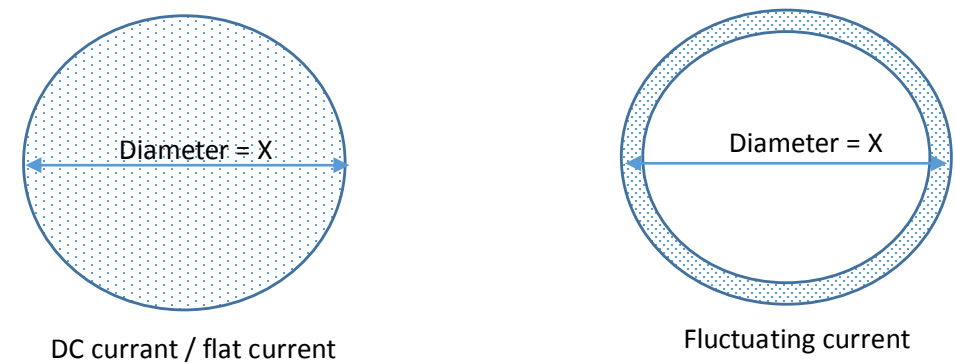
These phenomena inhibit generates of magnetic wave to resonance of membranes transducer and trigger heat, noise and other inefficiency in it. Multi wires method is the method that substitute single big wire to multi small wires that has same size to increase electrons flow.

Change to be

D   d   d   d

Single big wire with diameter D change to be couple small wires with dimeter d in same size. Conventional antenna using single big wire or flat rigidly conductor in one coil but multi wires method substitute single big wire or flat rigidly conductor to multi small wires with same all shape factor.

Both wire with diameters D and d have the same size $\frac{1}{4}\pi D^2$ and $\frac{1}{4}\pi(d^2 + d^2 + d^2)$

$$\frac{1}{4}\pi D^2 = \frac{1}{4}\pi(d^2 + d^2 + d^2) \qquad D^2 = 3d^2 \qquad \text{If D = 0,35mm so d = 0,2mm}$$

The circumference of wire is area that electron flow. In wire D has πD = 0,35π mm and in wire d has 3πd = 3*0,2π = 0,6π mm of circumference.

No	Diameter (mm)	Extent of wire	Size of wire /wires	Circumference of wire
1	0.35	1	0,096 mm²	0.35π mm
2	0.25	2	0,096 mm²	0.5π mm
3	0.2	3	0,096 mm²	0.6π mm

$Increasing\ electric\ current\ = electric\ current\ compared.\,L$

With knows wound scheme and size of coils wire increase of torque will obtainable

Equations Conversion	Conventional transducer	Multi wires transducer
Electromagnetic induction from 4 Maxwell equations	$\oint \vec{E}.\partial \vec{l} = \dfrac{\partial \oint \vec{B}.\partial \vec{s}}{\partial t}$	$\oint \vec{E}.\partial \vec{l} = \dfrac{\partial \oint \vec{B}.\partial \vec{s}}{\partial t}$
Electric current	$\dfrac{\dfrac{\partial \oint \vec{B}.\partial \vec{s}}{\partial t}}{Impedance}$	$L.\dfrac{\dfrac{\partial \oint \vec{B}.\partial \vec{s}}{\partial t}}{Impedance}$
Electric power and sound power	$\dfrac{\left(\dfrac{\partial \oint \vec{B}.\partial \vec{s}}{\partial t}\right)^2}{Impedance}$	$L.\dfrac{\left(\dfrac{\partial \oint \vec{B}.\partial \vec{s}}{\partial t}\right)^2}{Impedance}$

If [L] is the factor of increasing discretion electron flow is proportional increasing of circumference in same size based on experiment. [L] factor of increasing of discretion for three wire 0.2 mm of diameter with single wire 0.35 mm diameter is $L = \dfrac{0,6\pi}{0,35\pi} = 1,7142$ Meanwhile L for single wire = 1. For single wire with 0,35 mm of diameter $L = \dfrac{0,6\pi}{0,6\pi} = 1$. With [L] = 1.7142 it will increase capacity current wires as it increases of [L]. Increase of [L] will cope proximity effect, eddy current, skin-effect and will decrease heat, noise and also increase flexibility.

[L] is the factor of increasing discretion electron flow, increase quantity electron flow and decrease all cause of noise, heat and all disturbance in electron flow or electric current.

Increase of [L] will increase quantity electron flow cause of increase of area flow in same time this increasing will cope all cause of noise.

Comparison of Small rigid and flexible micro strip antenna Radiation Pattern

Conventional Small micro strip antenna

Beam width

PEMF and Multi wires flexible Small micro strip antenna
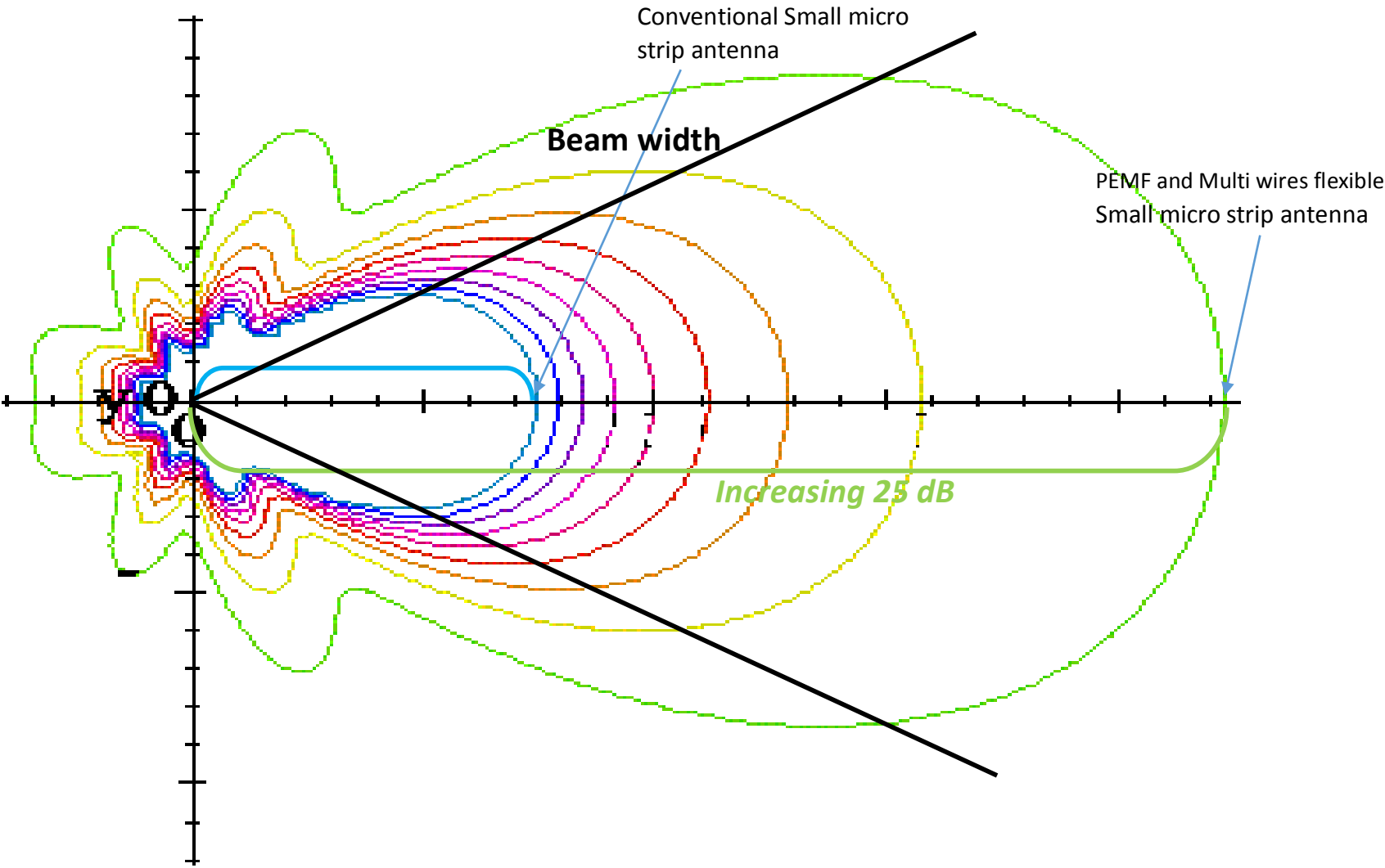
Increasing 25 dB

Small antenna with PEMF and Multi wires method in increase quality and range communications and detection access.

1.Increase antenna communications and detection Gain without decreasing beam width (Increase sensitivity of Antenna).

2. Increase range detection and communications in active and passive detection and communications system.

3. Compatible in all kinds of radio wave and micro wave and all detection and communications system.

4. Increase received of signal quality, Increase of Reliability and availability of signals received of flexible antenna.

5. Have possibility in increasing microwave and radio wave technology and possibility to sense deeply in communications and detections technology.

6. Low cost production and application, And more advantages

Prototype Flexible PEMF and Multi Wires antenna test result

Test did at December 28, 2019 and used these technologies are repeater that it was not possible use in micro-strip patch antenna.

Multi wires method repeater

As Transmitter of repeater   As Receiver of repeater

PEMF and Multi wires method repeater

As Transmitter of repeater   As Receiver of repeater

We will not explain how the repeater work but at the moment this repeater is in production and sell for increase signal quality with several developments that make it simple and easy to install.

In this test we found the incredible increases of antenna technology that it will not possible use with conventional antenna.

The product Free energy repeater
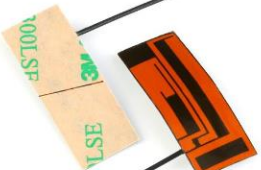
New kinds of micro-strip patch antenna with PEMF and Multi wires method

Patch PEMF and Multi wires micro-strip have [L] = π in bidirectional antenna and 0.5π in unidirectional antenna and with this increasing in will cope problem of directional and aperture antenna if it bent.

Beside that with Patch PEMF and Multi wires micro-strip design it more flexible than conventional patch antennas core set below.

Patch conventional micro-strip

Flexible magnet

Patch PEMF and Multi wires micro-strip

Lightweight: 0.5 gram
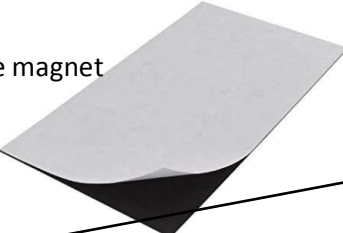
SWR: 1.33 and less

Gain: 25 dbi
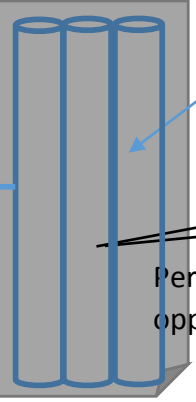
Work in all frequency

	Conventional dipole antenna	PEMF and multi wires method patch antenna with flexible magnet 1.4 Tesla
Increasing Gain and signal quality	0 dB	25 dB
Maximum range detection	1.000 meters	53.500 meters
Beam width	360^0	360^0

Example 1 Application PEMF method patch micro-strip antenna receptor of Drone and Controller

flexible magnet

Antenna in Drone and controller

Permanent magnet with opposite pole position

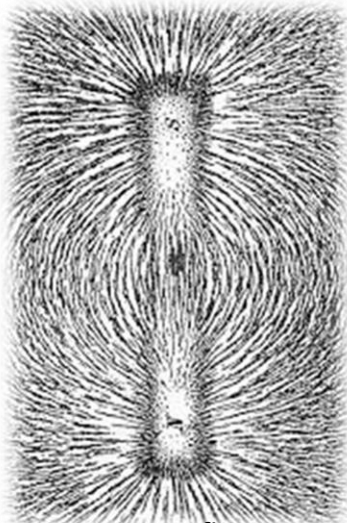*PEMF and Multi Wires Method with flexible Magnet*

With compare Conventional antenna and PEMF and Multi Wires antenna in same parameters. PEMF and Multi Wires method will increase sensitivity of antenna to sense electromagnetic signal. Increase sensitivity means are increasing gain or directivity without decreasing beam width and it will maintain signal quality in detection and communication. Table below explain increasing sensitivity sample dipole antenna communications with NdFeB PEMF and Multi wires method in increasing range detection without decrease signal quality of antenna receiver more than 500% so with applicate PEMF method will increase range transmission and detection.

Technology comparison		Profit potential	
Conventional technology	Technology that proposed	Conventional technology	Technology that proposed
Relatively high installation and operation and also less flexible	New technologies antenna that increase energy efficiency, sensitivity, flexible and low cost installation.	Relatively high installation and operation and also less flexible. It will have problem in antenna characteristic such directional and aperture antenna if it bent	With flexible antenna that cope all antenna problem if it bent with Less than 20% cost of conventional patch antenna production cost. It directly increases sensitivity more than 600% of conventional technology and the technology will have possibility of profit more than 50% that possible more interest in market.

Example 2 Installations PEMF method to Point- to point Wi Fi and cellular communications

Small NdFeB N52 magnet inside of cell phones case with opposite position. Dimension of magnet 10% of antenna dimension that based on working prototype it will not disturb signal propagation and cell phone itself. Position of antenna and magnet are inside of magnetic field.

Small NdFeB N52 magnet

Magnet flux

Small NdFeB N52 magnet

cell phones case

Patch PEMF and Multi wires micro-strip

North
South
South
North

Cell phone with case
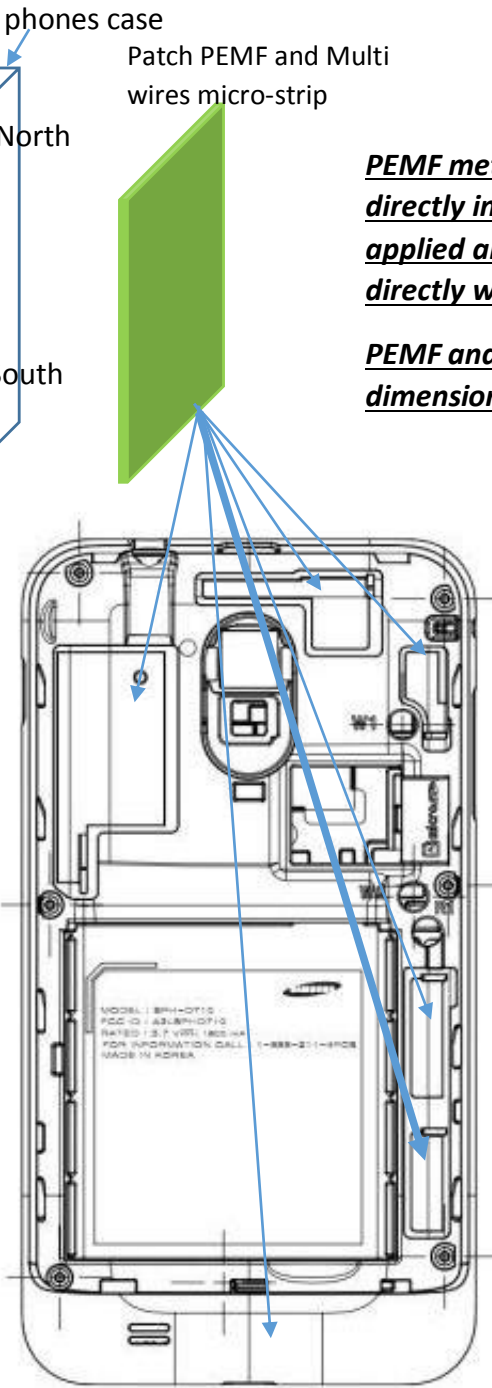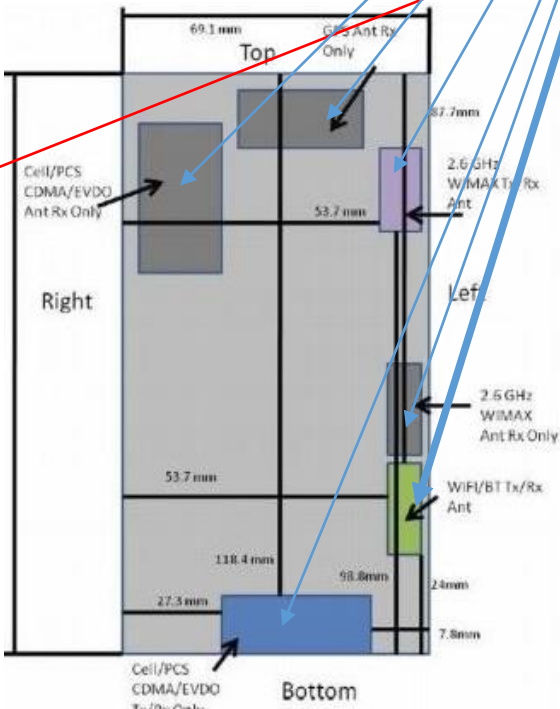
PEMF method use small dimension magnet attached in case and directly increase transmission technology compatibly, ease to applied and compatible for unlimited users and also compatible directly work to all Wi-Fi point to point applications programs.

PEMF and Multi wires method small in dimension without increasing dimension of cell phone and without additional power from battery.

Past achievements (e.g. additional information supporting the R&D capabilities, such as research papers and patents).

I represent of Logam Energy a start-up company that still in build that have several new innovations in electromagnetic induction for electric rotating machine, electric generating, transmission, detection and more.

Some papers also available in ACADEMIA science journal.

Test it technology for sure. I hope this innovation useful for all and I ready to cooperate and collaborate for it.

Estimated cost production

No	PEMF method parts	Quantity	Cost estimated
1	Cell phone case	1	$3
2	Small NdFeB N52	Several magnets for 1 case	$2
3	Patch PEMF and Multi wires micro-strip	1	$1
	Total		$6

Total cost production may decrease in manufacturing process. PEMF method have wide applications and Logam Energy ready to collaborate.