Tests on Superconductor Gravitational Effects

by Alexander V. Frolov

1. Theoretical background

The high density fluctuations in Bose condensate is laboratory scale case to confirm theoretical conclusions about gravitational field cut-off frequency [1]. This experimental work was organized to examine if some resonance effects in 10-100 MHz range can be detected as mass (weight) anomalies.

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2. Previous experimental data

Basically experimental approach in this area of research was described in [2] by Podkletnov:

1. Superconductor material was YBa2Cu2O7-x disk of 145 mm diameter and 6 mm high.
2. The effect is detected as 0.05% - 0.07% mass (weight) changes. It was detected for the case of non-rotating high temperature conductivity superconductor (HTCS) disk, which is leviting in 50-106Hz EM field.
3. Rotation of the disk increase the effect. Important fact is that during change of rotation velocity of the HTCS disk the effect was about 2-4% that is maximum data.
4. In the case of constant rotation velocity (about 5,000 rpm) the effect was detected about 0.3% - 0.5% change of the weight.
5. The effect was detected also for the case of rotation of the HTCS disk after EM field of solenoids was off.

Other experiment of 1995 was described by Podkletnov [3]. Two-phase material of the disk: in the operational mode the upper layer of the disk is superconductive the layer below is not superconductive. So, in this case the area of the phase transition between two layers was created especially.

One more important step in understanding of the effect was made by G. Modanese [4], who assumed that mechanical rotation of the HTCS disk produce motion of Bose condensate like electric current in HTCS material.

Next experiment by Podkletnov and Modanese was described as “impulse gravity generator” [5]. They used 50,000 A and 1MV electric discharge onto HTCS target to create non-dissipative “force beam” or gravity wave. This experiment is new step in understanding of process since

Podkletnov's idea of "shielding of gravity" is changed to conception of force action against gravity. This action is possible as result of artificial gravitational wave or impulse.

Static tests mainly were not effective but important example is experiment by John Schnurer [6]. The effect was detected in the case on non-rotating HTCS disk, which was leviting above permanent magnet. The effect was detected only during change of HTCS material phase from superconductor to non-superconductor phase (heating above Tk). This phase transition usually takes several seconds (2-3 seconds) when the effect can be detected.

Experiment with rotating HTCS ring described in [8] is example of gravimagnetic field produced by spinning superconductor. The results were presented at a one-day conference at ESA's European Space and Technology Research Centre (ESTEC), in the Netherlands , 21 March 2006. This experiment is the gravitational analogue of Faraday's electromagnetic induction experiment in 1831.

One more important aspect of experimenting with HTCS materials is their low temperature in superconductive state. This temperature is much low than environmental temperature and by this way the intensive heat transport present in all experiments. For the case of precise measurements flows of air produced by the temperature difference can be screened but there is aspect named as thermogravitation. For example, in Dotto ring [9] experiment it was demonstrated that intensive heat transfer along the ring produce gravimagnetic effects. For present experimental task it is not critical aspect since this effect is static i.e. it produce permanent force.

3. Related theories

Analysis of previous experimental and theoretical data allows to assume that gravity related effects resulting from changes of density of the Bose condensate. Maximum effect can be estimated for the case of correct frequency of oscillations of the external field, which resonate with natural high-density fluctuations in Bose condensate. In the case of correct frequency we can estimate full compensation of natural gravity field. Assume that the natural gravity field is not single frequency oscillation process. Complex frequency structure of the natural gravity field requires determine several main resonance frequencies to obtain full compensation.

Single phase transition in HTCS material [6] also is the case of change of the Bose condensate density (from maximum value to zero). Since in this case the change of the phase from superconductor to non-superconductor is gradual then the effects is weak and detected during several seconds. Experiment described in [5] is one of methods to produce rapid change of the phase in all Bose condensate of the HTCS target to create short but powerful gravitational pulse.

The nature of this gravitational pulse can be described here as longitudinal wave in aether. By this approach we can see analogy with Tesla experiments. Also we can see that impulse gravity generator by Podkletnov and Modanese [5] is development of Morton beam generator [7], which used electric spark between charged ball and metal plate to produce "Morton force beam". Powerful force effect in HTCS case [5] can be explained by coherent behavior of Bose condensate that produce "laser effect" since it is similar to coherent photon emission in laser.

Analysis of experimental data allows assume that:

1. Bose condensate currents in stationary HTCS disk involve aether in motion relative lattice in matter of the HTCS disk. This **relative motion** generate gravimagnetic field, which is responsible for the weight changes.

2. Rotation of the HTCS disk with Bose condensate currents produce more powerful effects due to **increase of the relative velocity** between Bose condensate and lattice of the matter of the disk.

3. **Change of rotation velocity** of the HTCS disk (i.e. **deceleration or acceleration**) produce maximum relative velocity between matter lattice and moving Bose condensate due to its inertial properties. Here is clear analogy with electromagnetic induction effects.

4. **Phase transition** from HTCS condition to non-superconductive phase is the case of maximum change of the Bose condensate density (zero – maximum or maximum – zero) that is responsible for generation of single **aether density wave.**

5. Special material of the HTCS disk [3] with **two-phase layers** demonstrated more powerful effects. It can be explained since in such disk there is **boundary layer** between superconductive and non-superconductive areas. External electromagnetic field make this layer produce **high frequency phase transitions** that generate high frequency aether density waves.

6. Impulse gravity generator [5] produce more powerful effect than Morton beam generator due to coherent behavior of the Bose condensate. The nature of this effect is the same **longitudinal aether wave** discovered by Tesla.

7. Experimental data from ESTEC [8] is confirmation of the above suggestions. Any rotation of mass by Einstein produce **gravimagentic field** that can be explained by aether dynamical theory. Spinning superconductor produces more powerful effect than non-superconductive matter due to physical properties of Bose condensate.

4. Conclusions

Considering matter as vortexes in aether it is possible to explain most of gravitational phenomenon. For example, inertial property of mass can be explained by behavior of aether, which is connected with this mass. Old theory [10] by Fatio (1690) and Le Sage (1700) can be confirmed in modern experiments. So called "gravitational waves" or "gravitational impulses" can be created as aether density waves, which are longitudinal waves. Bose condensate in superconductor can be presented as special physical state of matter when matter is connected with aether in different extent than usually. Phase transition of matter between superconductive state and non-superconductive state release or connect (join) some amount of aether and this phase transitions can be organized with high frequency to generate high frequency aether density waves. In the case of resonance (predicted in [1] range of frequencies is 10-100MHz) compensation of natural gravity forces can be obtained experimentally.

5. Organization of tests

HTCS disk was ordered from CAN superconductor producer [11]. Material is melt textured $YBa_2Cu_3O_{7-x}$ with Y_2BaCuO_5 excess. Critical temperature 90 K. Diameter 56 mm height 16 mm , Fig.1.

Fig.1 HTCS disk

Cooling of the HTCS was organized by liquid nitrogen, the HTCS disk was placed in plastic tank and immersed in nitrogen vapors, Fig.2.

Fig.2 One of the plastic tanks with the HTCS disk

Fig. 3 Cooling by liquid nitrogen

Detection of weight changes was made by digital scales HL-100 with accuracy 0.01 g . Balance rod with mass difference about 20g was organized in stable place of laboratory where any vibrations were minimized. The loads are 50g and 70g. In other experiment two loads were equal to 500g and balanced with small (about 20g) difference Fig.4. The loads made of plastic.

Fig. 4 Balance scales

Rotation of HTCS disk was organized mechanically by 3.000 rpm electromotor, Fig.5

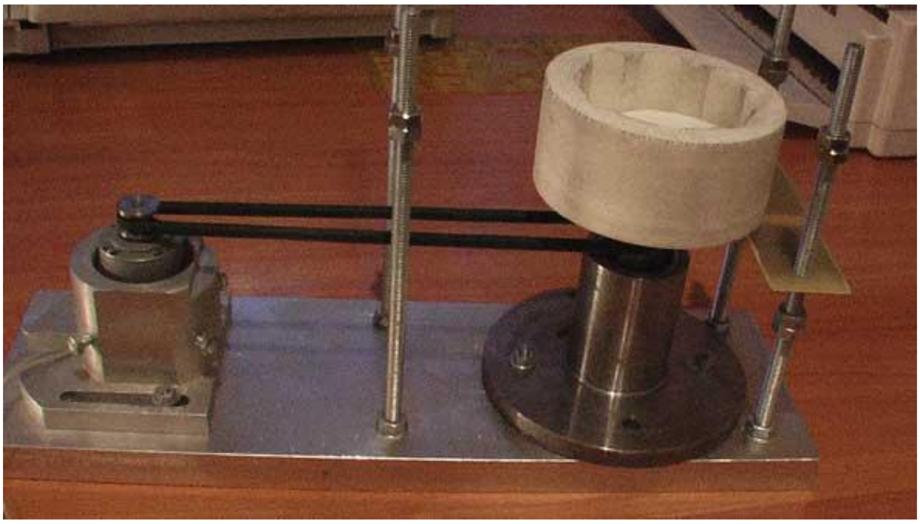

Fig.5 Electromotor and rotating plastic tank for HTCS disk

In this experimental setup the HTCS disk placed in the rotor and cooled by liquid nitrogen can be used in superconductive state only during 20-30 seconds. Due to this problem many measurements on rotational tests can not be reported here as reliable data.

6. **Logbook**

June 23, 2007. Reproduction of Schnurer experiment with balance scales. There are not visible effects for the phase transition from superconductive state to non-superconductive.

It was planned to build more precise rotational detector for more precise measurements. Production of low frequency and high frequency generators and experimental setup to rotate HTCS disk was started.

Other experiment was organized June 23: high voltage discharge to HTCS disk, which was immersed in liquid nitrogen, Fig.6.

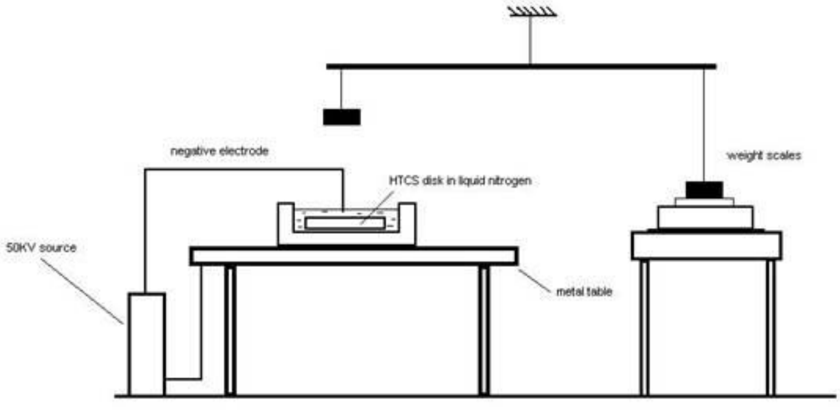

Fig.6

Initially significant weight changes (up to 0.3 g) were detected for the case of negative electrode connection to HTCS disk, which was immersed in liquid nitrogen. But future testing without HTCS disk also produced effects, which were identified as electrostatic interference to digital weight scales.

June 30, 2007. Test with rotational detector, Fig.7

The detector is made of wooden rods and plastic loads. Small glass plate in central point of the horizontal rod reflect red laser beam to the wall of the laboratory placed in 2 m distance that allow to detect small angle oscillations of the horizontal rod. Vertical axis is made of tungsten wire 0.05 mm diameter. All parts of the detector are placed under glass bell to avoid air flow interferences.

Experiment: cooled in plastic tank HTCS disk was placed near the detector. After 30-40 seconds when the disk is changing to non-superconductive state **the attraction of mass to the disk was detected.** After 3-5 min the detector is turning back to previous stable position. Maximum of the effect was measured if the HTCS disk was oriented by its flat side to the detector. Experiment was reproduced 4 times.

It seems to be impossible provide any quantitative data on this effect and future testing is necessary.

Possible mistakes here related with heat and cold flows, i.e. thermogravitation theory. To confirm or disprove this idea new tests with cold non-superconductive mass was organized. Metal disk of mass, which is equal to mass of tested HTCS disk, was cooled by liquid nitrogen and placed near of the rotational detector. Small effect of attraction of the load to the cold mass also was detected in this case. Values of effects for HTCS disk and simple metal disk are different. Conclusion: future testing is necessary to confirm if phase transition in superconductor generate gravity wave and produce attraction/repulsion of the detector.

Fig.7 Rotational detector

July 2, 2007. Experiment with permanent magnet installed near of rotating HTCS disk.

This experiment was planned to test if Lorenz force can be reason of gradient in Bose condensate that change its density and generate gravity wave. Fig. 8 is the case of radial magnetic field and Fig.9 show axial superposition of the permanent magnet (Faraday disk).

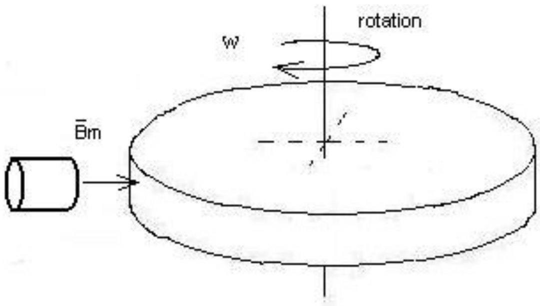

Fig.8 Superconductive disk and radial magnetic field

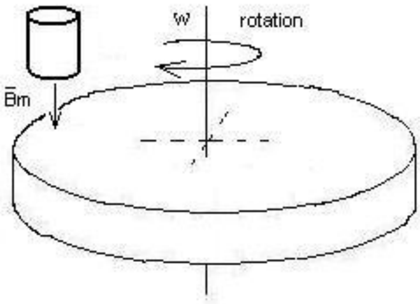

Fig.9 Superconductive disk and axial magnetic field

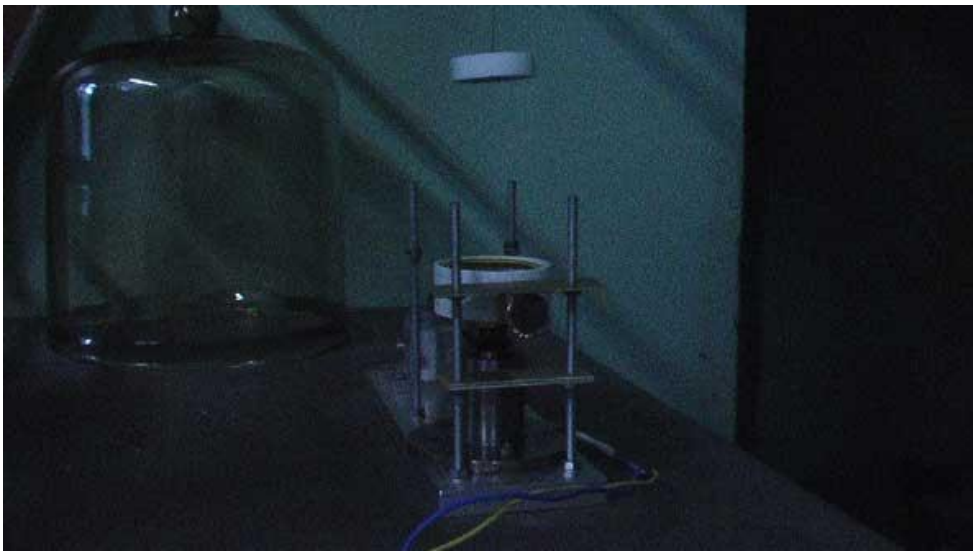

Fig.10 Radial permanent magnet installed near rotating HTSC disk.

Mass of the loads for this case was 50g (above the HTCS disk) and 70g (on the weight scales). Rotation velocity about 2000 rpm. Magnet of 1T field is made of NdFeB material, cylinder of 25 mm diameter and 24 mm height. Distance from magnet to HTCS disk is about 7 mm.

Weight changes were detected as 0.02 g only in experiments with axial superposition of the magnet (Fig.9). It is equal to 0.04% mass change that is too small to be considered as reliable data.

June 04, 2007

Tests with low frequency magnetic field was organized both for the case of stationary HTCS disk and for the case of rotation of the disk. Sinusoidal input signal with frequency from 10Hz up to 1KHz was connected to transistor current amplifier loaded on output coil. For frequencies between 10Hz – 100Hz the coil was made as 500 turns of 1 mm wire on U-shape transformator metal core, Fig. 11.

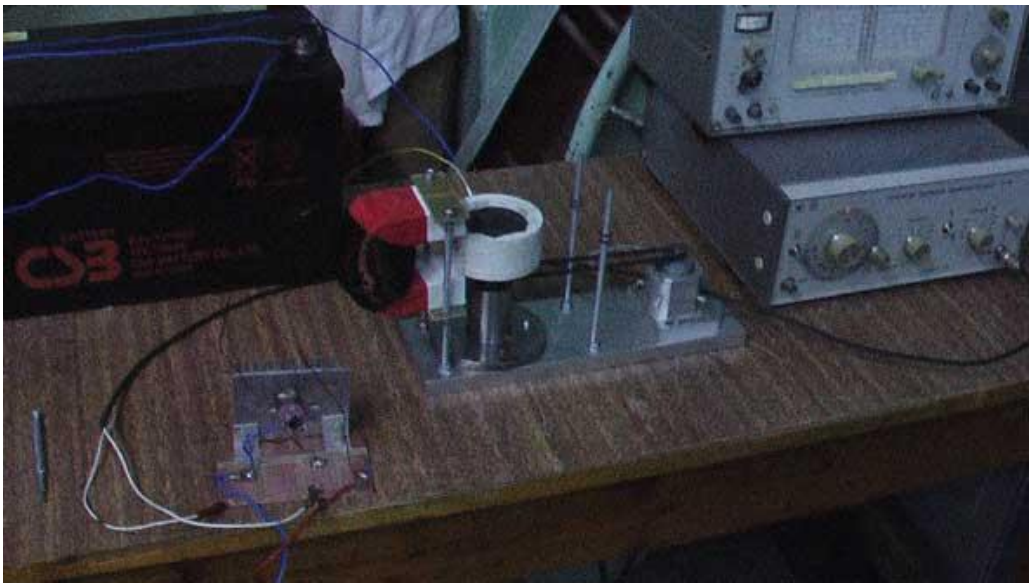

Fig.11 Low frequency tests

Frequency from 100Hz up to 10KHz was tested with other output coil and ferrite core, Fig.12 and Fig.13.

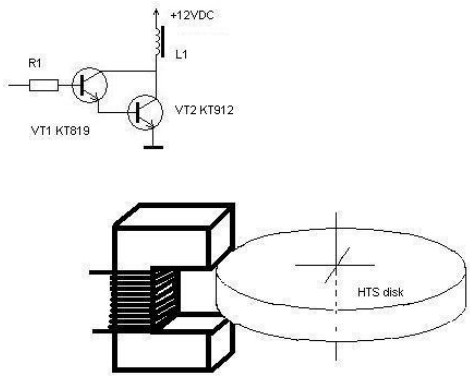

Fig.12

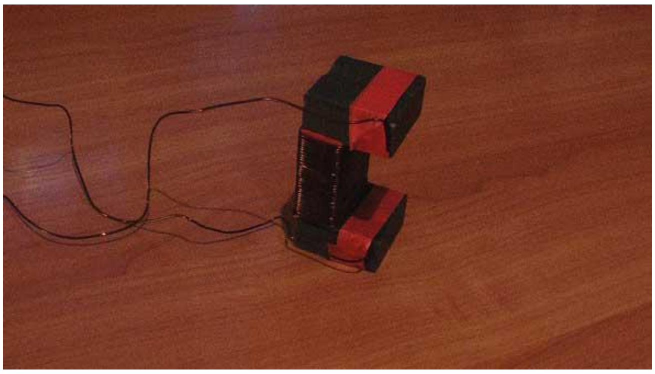

Fig.13

Small positive result was detected for the case of rotation in the field of 1kHz frequency. Weight changes was detected as 0.02 g for mass of the load 500g. Probable it was measurements mistake since percent ratio of the mass changes here is 0.004% only.

July 09, 2007

Tests for frequencies from 10KHz up to 3MHz were organized with air core output coil placed above HTCS disk, Fig. 14 and Fig.15.

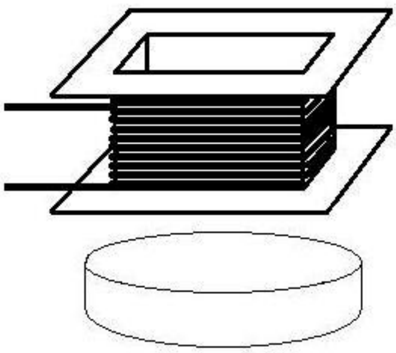

Fig.14

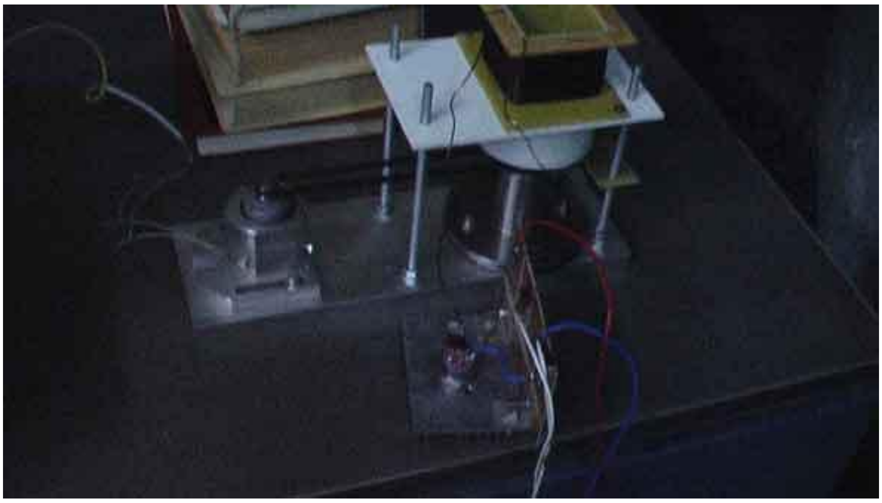

Fig.15

All tests in this case were negative, i.e. it was not confirmed that electromagnetic field in this case produced significant weight changes. Both stationary and rotational HTCS disk were tested.

July 12, 2007

High frequency generator was designed, Fig. 16 – Fig.17 for tests of 3MHz – 40MHz frequency band. Output power is about 10-30Wt.

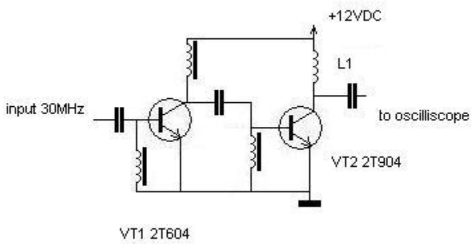

Fig.16

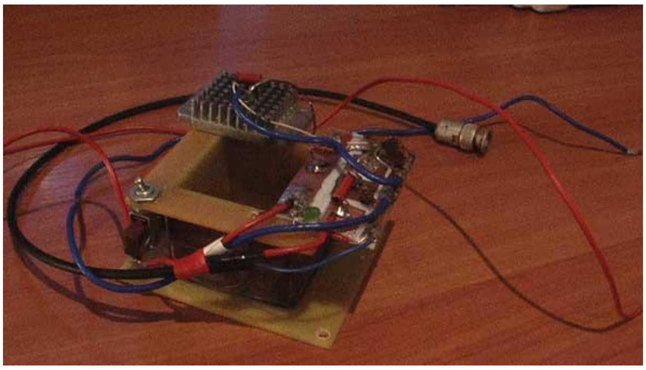

Fig.17

Weight changes were detected as 0.06 g for the case of stationary disk and frequency about 30MHz. High frequency generator was installed above HTCS disk, which was immersed in liquid nitrogen. It seems to be strange that the weight change were stable after the electromagnetic generator was OFF. Quantitative data: this weight change is about 0.01% only.

The case of rotation of the disk in high frequency electromagnetic field also was testes but without estimated effects, Fig.18. Perhaps that in this case important data was missed due to short time of superconductive state of the disk placed in the rotor. Other possible reason is that high frequency electromagnetic field was dissipated in metal parts of the rotor.

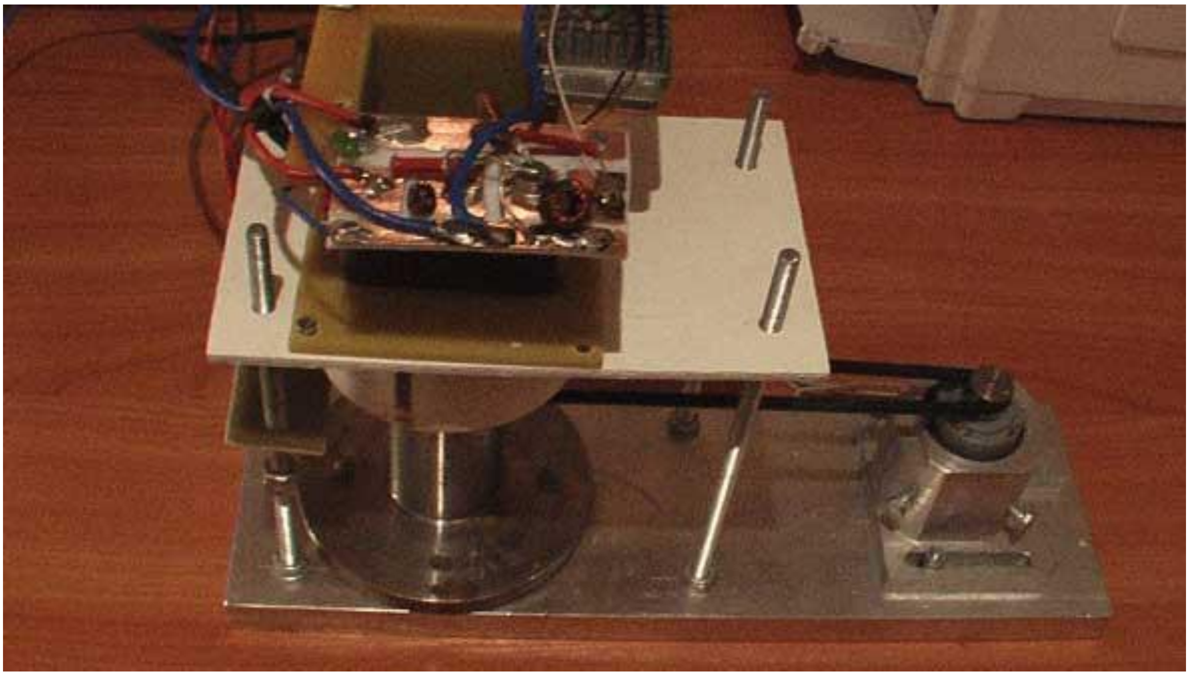

Fig.18

7. Conclusions

7.1. Experiments were organized with low power electromagnetic field. Due to short time of superconductivity state of rotating HTCS disk, reported effects for rotation tests can not be considered as reliable data and additional experimenting can be necessary.

7.2. There is positive effects in the case of rotation of the HTCS disk in permanent magnet field oriented cross the disk axially. If this effect is not a mistake then it can be explained by consideration of conditions created by this design for local gradient of Bose condensate density in the disk due to Lorenz force. Oscillations of this density due to rotation for the disk can generate gravity wave in axial (vertical) directions above and below the permanent magnet.

7.3. Main task of the project was to find resonance effects in 10-100MHz frequency range. Some effects were detected for 1KHz and 30MHz frequencies. To get more reliable data it is necessary to increase power of electromagnetic field.

8. **Planning of the future experiment**

Rotation or motion of HTCS matter in future tests is not planned. It is planned to test superconductor films instead of solid state disk. Instead of high frequency electromagnetic field producing induction currents in HTCS it is planned to use high frequency electric fields, which allow to create high frequency oscillations of Bose condensate and by this way to change its density to find reliable experimental data on resonance frequencies predicted in [1].

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