

DESIGN CONSIDERATIONS FOR SUPER-CONDUCTING MAGNET N-MACHINE JPI-II

by

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ABSTRACT

The successful confirmation of the so-called incremental over-unity phenomena in the JPI-I N-machine (Inomata and Mita, 1993) has led the authors to design the system over-unity machine JPI-II, which is composed of a super-conducting magnet N-machine, and a super-conducting magnet Faraday motor. This combination on the same axle, after being started by the outside electrical power source, is expected to feed some 30 to 40 KW AC power. This power is in addition to the required cooling energy of the vaporized coolant which is essentially negligible if sufficient heat insulation is provided for the super-conducting coils. The N-machine theory, the experimental data (JPI-I) and the design details of the super-conducting magnet N-machine, JPI-II, will be described in this paper.

INTRODUCTION

Recently, there has been increasing interest in the N-machine "space power generator", because it has the possibility of producing electrical energy with significantly less mechanical power input. Furthermore, the possibility of system over-unity operation could be envisaged. The constructed JPI-I machine is a small Neodymium magnet twin N-machine. Having carried out several experimental measurements, we had confirmed the so-called incremental over-unity or local violation of energy conservation law. That is, in case of one experiment, at 6000 rpm, the electrical power extracted from vacuum is 5.81 watt, and the increased electrical power to the drive motor, in that time, is 3.24 watt. Therefore, we have 2.57 watt surplus of energy. The experimental results had been presented at Japan Psychotronics Institute (JPI) monthly meeting on 27 March, 1993, Tokyo. On the other hand, the back-torque was found rather big. This suggests that improvements are necessary.

Nevertheless, we have found very surprising phenomena, in which electrical current increases nonlinearly as rotational speed increases. It is as if copper-carbon brushes were cooled down more than 100°C. This decreasing resistance phenomenon has occurred in the copper-carbon brush materials around the rotating magnets disc with high speed. This phenomenon might be one of the most important evidence of shadow energy extraction from the vacuum. Inomata's vacuum theory (Inomata, 1987) requires the reexamination of Dirac's vacuum theory. The absolute vacuum is considered as a balanced sea of both positive and negative "shadow energy". Both positive and negative shadow energy are described by shadow Dirac equation. We consider that the sea of shadow charge corresponds to non-material ether.

Furthermore, we can obtain probability density flows between real world and shadow (imaginary) world, which coincide with what the consciousness-electrical charge, complex matter, complex energy triangle claims. Because matter is energy in conventional physics, so the energy extraction becomes legitimate in this paradigm of new science.

In this paper we describe the design of a New N-machine (JPI-II) aiming at system over-unity, which uses super-conducting coils for the construction. It is shown that there exists the possibility of system over-unity operation by showing the detailed design and estimating output-power.

THEORETICAL CONSIDERATIONS

According to the Dirac's vacuum theory, a vacuum consists of a sea of electrons in negative energy levels. We consider here that this viewpoint of a vacuum should be abandoned.

From our new paradigm viewpoint, the absolute vacuum is considered as a sea of non-material ether which transcends space-time. We consider that the ether consists of a balanced sea of both positive and negative "shadow" energy of infinite magnitude. This corresponds to the stationary ether, which H.A. Lorentz assumed in his theory. In this theoretical considerations, the CGS system will be used.

We shall consider the S reference frame, which is a stationary frame for the observers and the ether, and the S' frame, which is moving with constant velocity relative to the S. For simplicity, we shall consider the S' to be moving with speed v along x (or x') axis relative to S. We think that the Maxwell equations of the same forms are satisfied in the reference frames S and S'

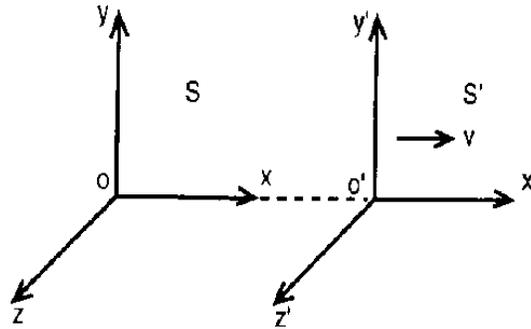


Figure 1. Coordinate Reference Frames S and S'

We can obtain the transformation formulae for E and H. We will do this only for the particular Lorentz transformation described by Equation (1).

$$\begin{aligned}
 E'_x &= E_x & H'_x &= H_x \\
 E'_y &= \gamma (E_y - \beta H_z) & H'_y &= \gamma (H_y + \beta E_z) \\
 E'_z &= \gamma (E_z + \beta H_y) & H'_z &= \gamma (H_z - \beta E_y)
 \end{aligned} \tag{1}$$

(where $\gamma = 1/(1 - v^2/c^2)^{1/2}$, $\beta = v/c$)

If v is far smaller than c, we can obtain the relations $\gamma \approx 1$, $\beta \ll 1$. Moreover when there exists only H field perpendicular to the moving direction, we can obtain the transformation formulae of Electromagnetic Field described by (2).

$$\begin{aligned}
 E'_x &= 0 & H'_x &= 0 \\
 E'_y &= -\beta H_z & H'_y &= H_y \\
 E'_z &= \beta H_y & H'_z &= H_z
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 \downarrow & & \downarrow & \\
 E' &= \beta \times H \quad (3) & H' &= H \quad (4)
 \end{aligned}$$

These results clearly show that the electric and magnetic field vectors E and H are really non-independent existence. The resolution into electric and magnetic components is due to the motion relative to the observer and the ether. Moreover, if there exists a completely uniform magnetic field, there is no meaning of distinction between H and H' field. However, in S' moving frame, electric

field E' appears due to H field in S' frame. In the paradigm of the absolutism EM, E' is thought to be created by the H field moving in the stationary frame.

From (3), we can obtain the EMF for N-machine. Thus, we consider a plane conducting disk with magnets of radius r rotating with constant angular speed ω . The uniform H field is perpendicular to the plane of the disk.

$$\begin{aligned} E'_r &= (v/c) \times H = (\omega/c)H_z r \\ (\text{where } v \perp H, v &= (\omega \times r)) \end{aligned} \quad (5)$$

In the paradigm of relativistic EM, $E'(x,t)$ only exists in the mind of an observer of S frame. On the contrary, in the paradigm of the absolutism EM, $E'(x,t)$ is thought to be "real", irrespective of the existence of an observer (Inomata, 1991). This expression is the same as the Faraday generator. If the rotation is reversed, the equation changes the sign.

The potential difference between the center and the periphery of a copper disk become as below. R is the radius of a copper disk.

$$V'(\text{EMF}) = \int_0^R E'_r dr = (\omega/c)H_z \int_0^R r dr = (1/2)(\omega/c)H_z R^2 \quad (6)$$

Thus, the quantity of the potential difference are equal to the case of Faraday generator. The exact place where EMF is created is in a copper disk, and is not in a conducting wire, as relativistic EM (Einstein theory) predicts. H.A. Lorentz's theory which presupposes the stationary ether can supply the correct answer.

In Oriental philosophy, beside the cosmological view of "what is form that is emptiness, what is emptiness that is form", the idea of "real and imaginary, Yin and Yang" is also considered to be very important. Thus, in existing vacuum, if any amount of positive shadow energy exists, exactly the same amount of negative shadow energy should exist and they should offset each other. From new paradigm viewpoint, the vacuum is considered as a sea of non-material energy which transcends space-time. Mathematically, this concept is described by complexified Dirac equation [real and imaginary (shadow) equations] using natural unit.

Dirac equation

$$i \cdot \frac{\partial \Psi}{\partial t} = (-i \alpha \cdot \nabla + \beta m) \Psi \quad (7)$$

Shadow Dirac equation

$$- \frac{\partial \Psi}{\partial t} = (-i \alpha \cdot \nabla + \beta m) \Psi \quad (8)$$

where Ψ is a wavefunction. We can obtain probability density flows from an imaginary Dirac equation. Inomata's theory goes beyond the contemporary conventional statement which relates mass and energy (Einstein; $E=Mc^2$), conservation of energy and charge. This theory introduces complexified mass, energy, charge and develops mathematical relationships for each one and their relatedness.

Here we would like to discuss the interdependency of real and shadow (imaginary) world. In general, Schrodinger equation in quantum mechanics is obtained from the conventional relation between energy and momentum, $E=p^2/2m$. After replacing by the operators; $E \rightarrow i \cdot \partial/\partial t$, $p \rightarrow -i \cdot \nabla$, Schrodinger equation becomes

$$i \cdot \frac{\partial}{\partial t} \Psi = - \frac{1}{2m} \nabla^2 \Psi = H \Psi \quad (9)$$

where H is called Hamiltonian. When the eigenfunction of Equation (9) changes with time as $\psi(x,t) = \psi_0(x)e^{-iEt}$, it becomes $H \psi = E \psi$. On the other hand, to the relation which is $E = p^2/2m$ multiplied by i , and replacing by the operators, then we obtain

$$- \frac{\partial}{\partial t} \psi = - i \frac{1}{2m} \nabla^2 \psi = iH \psi \quad (10)$$

and we obtain $iH \psi = iE \psi$. This is "shadow Schrodinger equations". Generally speaking, it may be possible to regard $iH \psi = iE \psi$ as the quantum system to express vacuum as "void". But as iE indicates only positive shadow energy, it does not match the Yin and Yang property of shadow energy which we require. P.A.M. Dirac supposed the following linear equation for both $\partial/\partial t$ and ∇ to obtain positive and finite probability density $\rho \geq 0$.

$$i \cdot \frac{\partial \psi}{\partial t} = (-i \alpha \cdot \nabla + \beta m) \psi(x,t) \quad (11)$$

Dirac required that Equation (11) fulfills real Klein-Gordon's equation.

$$- \frac{\partial^2 \psi}{\partial t^2} = (-\nabla^2 + m^2) \psi \quad (12)$$

From this, Dirac's equation allows not only positive but also negative energy. The free solution of Dirac's equation is obtained in the form of $\psi = \omega e^{-ip \cdot x}$ when ψ is a column with 4 components and ω is a spinor with 4 components. Where, $p \cdot x = p_\mu x^\mu = Et - p \cdot x$. Since the details of mathematical treatments is explained in the literature (Inomata, 1987), we limit ourselves to state here that two values are allowed for E, as follows,

$$E = \pm (m^2 + p^2)^{1/2} \quad (13)$$

On the other hand, how does the probability of Dirac's equation flow? Here, the flow of probability can be obtained in relation with the following probability density.

$$\rho = \psi^*(x,t) \psi(x,t) \quad (14)$$

In Dirac's equation, the probability density of four dimensional wave function is definite and positive, and this is where it is different from Klein-Gordon's equation. Here we try to obtain shadow Dirac's equation. For this, we start from the following equation. That is:

$$- \frac{\partial \psi}{\partial t} = (-i \alpha \cdot \nabla + \beta m) \psi \quad (15)$$

After theoretical treatments, regarding a certain value of p , we obtain the same results as shadow Klein-Gordon's equation:

$$E = \pm i(m^2 + p^2)^{1/2} \quad (16)$$

This means we can obtain the sea of positive and negative shadow energies. Now let's look for the flow of probability density of shadow Dirac's equation. After mathematical treatments, we can show

that there is a flow of probability density from the state of shadow energy. Thus, we can obtain the probability density:

$$\rho = \exp \{ \pm 2(m^2 + p^2)^{1/2} t \} + c_{\pm} \quad (17)$$

where c_{\pm} is an integration constant. When shadow energy level is positive, we select $c_{+} = -1$,

$$\rho = \exp \{ +2(m^2 + p^2)^{1/2} t \} - 1 \quad (18)$$

and it indicates the probability density flow from shadow energy level to real energy level, thus, inflow of particles. However, this equation has no meaning when $\rho > 1$. On the other hand, when shadow energy level is negative, selecting $c_{-} = 0$, we obtain

$$\rho = \exp \{ -2(m^2 + p^2)^{1/2} t \} \quad (19)$$

and this indicates probability density flow from real world to shadow world, thus, outflow of particles.

By transferring from shadow Klein-Gordon's equation to shadow Dirac's equation, we could obtain the basic equations of micro-world which coincides with real and imaginary world as being interdependent and correlated, but not conventionally connected.

Thus, shadow Dirac's equation gives manifestation of vacuum as "void", which is lacking in contemporary physics. Now we want to discuss the problem of pair creation and pair annihilation of electron and its antiparticle, i.e. positron, using real Dirac's equation and shadow Dirac's equation simultaneously. In this case, we have two kinds of energy levels (in case $p=0$). Thus: (1) continuous state of positive ($E \geq +m_0$), negative ($E \leq -m_0$) real energy, (2) continuous state of positive ($E \geq +im_0$), negative ($E \leq -im_0$) shadow energy. If we suppose that negative real energy exists as Dirac did, we have to unreasonably equate negative infinite energy to zero energy and to equate infinite negative charge with zero charge. So we discard this level. And we suppose that shadow negative and positive energy levels exist. When these levels are occupied, it is clear that they bring no effect which can be observed externally as positive and negative shadow energy levels offset with each other exactly.

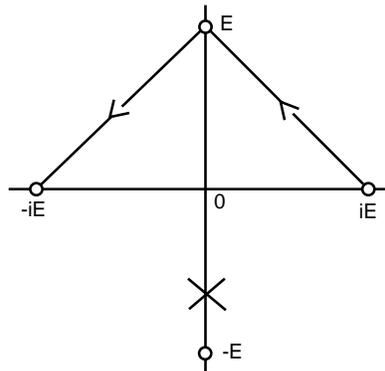


Figure 2. Complexified Energy Level

Now we suppose complexified energy level as indicated in Fig. 2. As it became clear through this section, positive shadow energy level acts in creation of probability density (particles), and negative shadow energy acts in annihilation of probability density (particles). It is known experimentally that $2m$ of energy (photon) is required for pair creation of electron and positron. We rewrite $2m$ as follows:

$$2m = m + m - im + im \quad (20)$$

That means, to transfer one electron from shadow positive energy level to real positive energy level, complexified energy $m - im$ is required. At the same time, from the law of charge conservation, the hole indicates positive charge, m supplies mass and im repairs the hole made in the sea of shadow energy (see Fig. 2). On the other hand, it is known that $2m$ photon is freed in case of pair annihilation of electron and positron. In this case, too, $2m$ is rewritten as Equation (20). An electron annihilates after freeing $m + im$ complexified energy. At the same time, positive charge of positron disappears, and its mass is freed as energy m . On the other hand, $-im$ is freed, and the equilibrium of positive shadow energy level and positive energy level is restored. What we explained so far is for the case when the law of usual energy conservation is maintained. However, as we analyzed in this chapter, there is a possibility of creation and annihilation of particles in line with "the super law of energy conservation" according to the consciousness-matter-energy triangle. The creation and annihilation of particles as matter, at the same time, indicates a possibility of energy creation and annihilation from vacuum as "void".

This preliminary study on vacuum indicates that the concept of "void" in Oriental philosophy is also correct scientifically. Now we are confident that the universe is formed from non-material primary substance, which may be described as the shadow charge (Chi or prana in Oriental philosophy) that gives birth to all things.

Now, we modify Newton's laws regarding two complexified masses, $M = M_1 + iM_2$ and $m = m_1 + im_2$. That is, using CGS system,

$$f_1 = \frac{GMm}{r^2} r^0 = - \frac{G(M_1 + iM_2)(m_1 + im_2)}{r^2} r^0 = \frac{(iG^{1/2} M_1 - G^{1/2} M_2)(iG^{1/2} m_1 - G^{1/2} m_2)}{r^2} r^0 \quad (21)$$

where G is Newton's constant, r^0 is the unit vector to indicate the direction of r and i is the imaginary unit. When we compare this with the equation of Coulomb force referring to complexified charge $Q = Q_1 + iQ_2$, $q = q_1 + iq_2$, using esu system;

$$f_2 = \frac{Qq}{r^2} r^0 = \frac{(Q_1 + iQ_2)(q_1 + iq_2)}{r^2} r^0 \quad (22)$$

the conditions to equate f_1 and f_2 for one branch are the following equations.

$$Q_1 = -G^{1/2}M_2, q_1 = -G^{1/2}m_2 \quad (23)$$

$$iQ_2 = iG^{1/2}M_1, iq_2 = iG^{1/2}m_1 \quad (24)$$

when (23),(24) are fulfilled, f_1 and f_2 become equivalent, and it becomes more consistent, if we take Newton's constant G as real number from psychotronics viewpoint. The meaning of (23),(24) is that the real part of the complexified gravitational mass functions as shadow charge and that its imaginary part functions as real charge. The origin of positive and negative charge is, then, imaginary part of negative and positive gravitational mass. The origin of positive gravitational mass is imaginary part of positive charge. Furthermore, we consider that gravitational mass and energy have only positive property. Thus, the imaginary part of charge is only positive. In real and imaginary part, we can obtain mass and energy relations by Einstein's famous formula ($E=mc^2$). We have reached the conversion formulae of complex charge, complex mass, complex energy triangle. These conversion formulae and relationships are summarized as following in Figure 3.

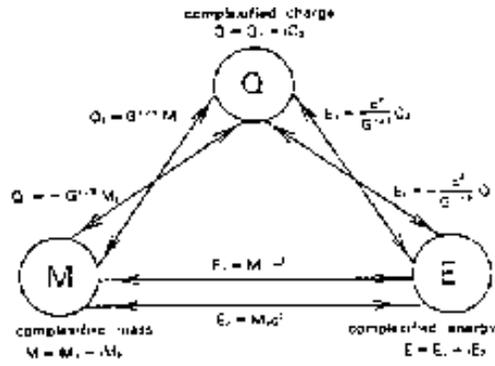


Figure 3. Conversion Formulae of Complex Charge, Mass and Energy Triangle

Figure 3.

Conversion Formulae of Complex Charge, Mass and Energy Triangle

In this triangle, every element, that is, charge, energy and mass, are complexified. The imaginary elements compose the imaginary world or shadow world. The real elements compose the real world, which we perceive. From our new paradigm viewpoint, we can understand the real and imaginary worlds as being interdependent and correlated, but not conventionally connected. Although there exist separate conservation laws of energy and charge in contemporary physics, we should recognize the violation of conservation laws for energy and charge in the real world, if we consider the shadow world. In the N-machine experiments, the electrical output energy is from the vacuum itself. This phenomenon indicates the conversion law from imaginary charge to real energy,

$$E_1 = \frac{c^2}{G^{1/2}} Q_2. \tag{25}$$

We believe that the imaginary charge corresponds to "Chi" or "Prana" in Oriental philosophy. We consider that the positive and negative states of imaginary energy corresponds to "Yin and Yang" in Oriental philosophy.

We also believe that the most fundamental element in universe is imaginary charge, which we call "panpsychic consciousness." Here, we have considered that imaginary charge is described by shadow Dirac neutrino equation.

$$- \frac{\partial \Psi}{\partial t} = - i \alpha \cdot \nabla \Psi \tag{26}$$

Thus, we believe that the basic oneness of the universe is not only the central characteristic of the mystical experience, but is also one of the most important revelations of modern science and technology. The result of the paradigm shifts are shown in the Appendix: New versus Old Paradigms.

Here, we would like to discuss the integration of fundamental forces in nature, that is, gravitational, electromagnetic, strong and weak forces. It is widely known that at present physicists are studying this type of problem under the title of so-called "gauge theory" in relation to cosmology. However, this gauge theory misses the point how these four basic forces are interrelated in the universe in which we are existing. We consider that it is very significant to seek these mutual relationships in the

universe in which we are living. In these paradigm shifts, we can obtain the integrated theory. The core theory is the complexified EM theory, and this theory is an integrated theory of EM force and gravity.

EXPERIMENTAL RESULTS

An illustration of the JPI-I machine is shown in Fig. 3. This machine is a two-rotor series machine and the driving force is supplied by a DC motor. The details of the JPI-I are given in Table 1. This test machine was fabricated by using four 9.0cm permanent magnets; two on each side of copper disks, four copper-carbon brushes are used. These brushes are mounted in aluminum blocks (Fig. 5). The rotation of the DC motor was transmitted to the N-machine by 1 to 2 ratio belt and pulley system.

The N-machine equivalent circuits for the measurements are shown in Fig. 6. According to the theory, an open circuit voltage (EMF) is linearly proportional to the magnet area, the strength of the magnet and the angular velocity. Using MKSA system,

$$V(\text{EMF}) = \frac{1}{2} \cdot \omega \cdot B \cdot (r_1^2 - r_2^2) \quad (27)$$

where ω is the angular velocity of a disk. B is the magnetic field perpendicular to the disk and r is the radius of the disk. The effective strength of the magnetic field is supposed to be 0.4 Tesla, according to the experimental date of the JPI-I machine. Furthermore, we have confirmed that the EMF has been produced in a magnets-copper disk, not in an electric conducting wire from the disk edge (Fig. 7). Moreover, we think that the magnetic shield to the conducting wire from the disk edge was especially very important to minimize the back torque. Yokogawa Electric shunt resistance (1m Ω) was used for accurate current measurements. The maximum capacity of this shunt resistance is 100 Amp. Furthermore, it is known that an N-machine behaves exactly as a regulated voltage source does. Thus, when tested at a fixed speed, the EMF remains the same no matter how much current is drawn from a generator (Valone, 1991).

Now, we present the experimental results. The measurements were carried out on 14 February and 7 March, 1993. The measurement data are shown in Table 2,3. The following measurements were carried out under the conditions shown in Fig. 6 unless otherwise specified. The experimental results are shown in Fig. 8, Fig. 9, Fig. 10, Fig. 11, Fig. 12, and Fig. 13. Next, we made the experiments to clarify the shadow energy extraction from the vacuum. We carried out the measurements about two different circuits, thus, open circuit and closed circuit modes. As Table 4 shows, we have made the comparison between the N-machine output power and the power increment of motor DC supply at same rotational speed. According to the energy conservation law, the N-machine output power should be less than the incremental power of the drive motor. In our N-machine measurement, even if the efficiency of the drive motor were 100%, one of four cases apparently shows incremental over-unity. However, we consider that the efficiency of the drive motor is less than 80% in these high rotational velocity range. Therefore, we conclude that all cases have shown the incremental over-unity phenomena.

Summarizing the measurement results of the JPI-I, we have obtained the following results and phenomena. (1) Linearly increasing EMF proportional to the rotational velocity. (2) Nonlinearly increasing load current as the rotational velocity increases. (3) The decreasing electrical resistance phenomenon in the copper-carbon brush materials around the rotating magnets disk in high rotational velocity range. (4) The confirmation of the incremental over-unity or local violation of energy conservation law in high rotational velocity range.

From our experimental results and experiences, we consider that there are three major improvement items for constructing a system over-unity machine. Those are: (1) a producing stronger magnetic flux density, (2) an expansion of rotor disk diameter and effective area, (3) a magnetic shielding to the conducting wires to extract current from the disk edge.

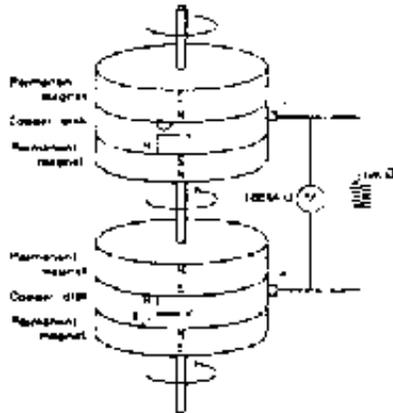


Figure 4. An Illustration of JPI- I Machine

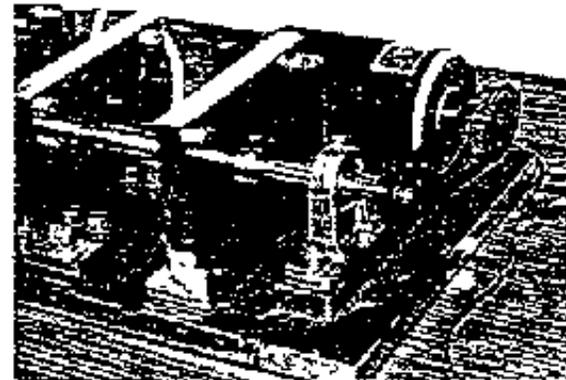
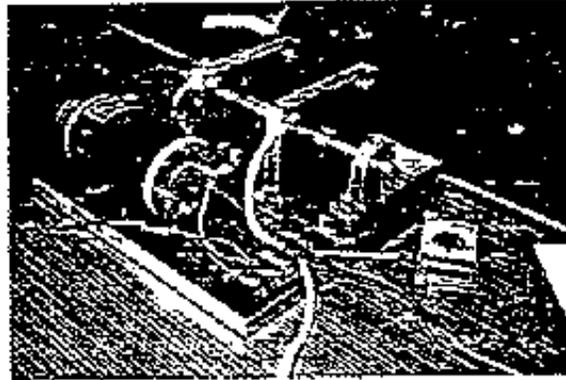


Figure 5. JPI- I Machine

Table 1. JPI- I Machine Data

Type	Experiment ver. 1st type
electric circuit	open magnet circuit type
size of a permanent magnet (four neodymium magnets)	outer diameter 90 mm inner diameter 60 mm thickness 10 mm
brush	copper carbon
rotor material	copper
drive motor	D. C. motor 24 V, 34 W, 5400 R, 1500 rpm

Design Specifications of JPI-II

Based on the knowledge obtained from the design, manufacture, and experiments with JPI-I machine, this machine (JPI-II) has been designed to be a system over-unity machine or a self-rotating electrical generator.

For this purpose, full utilization of super-conducting magnets and technology is planned. In the N-machine - Faraday motor combination, such a situation is realized, if the electrical energy created from the vacuum is bigger than the energy needed for no-load rotation of the N-machine plus the loss in the Faraday motor (Inomata, 1991). Moreover, the energy needed for reliquidization of vaporized coolant will be negligible, if sufficient heat insulation is provided for the N-machine-Faraday motor combination.

We begin our discussion of basic design specifications of JPI-II, based on the experimental data obtained from the JPI-I. The conceptual figure of JPI-II is shown in Fig. 14 and the specifications of JPI-II are shown in Table 5.

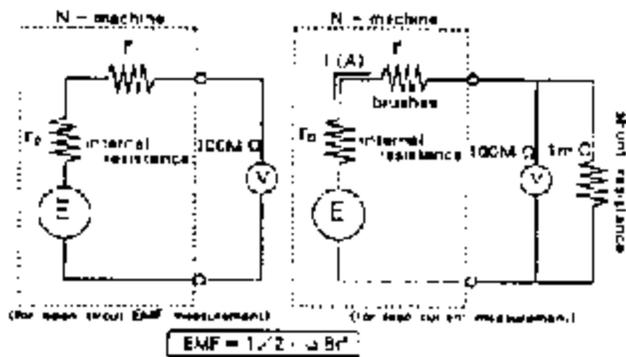


Figure 6. N-Machine Equivalent Circuits for The Measurement

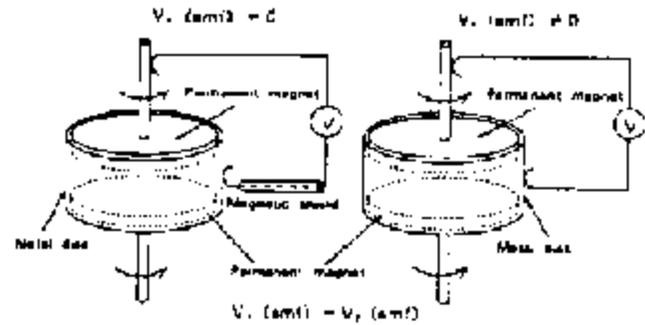


Figure 7. The Experiments to Confirm The Place of EMF

Table 2. The Measurement Data of JPI- I

(measurement data on 14 February 1983)

rotation velocity (rpm)	N-machine			with load (near speed)			
	open EMF (mV)	load current (A)	load power (W)	rotation (rpm)	torque (Nm)	power (W)	load speed (rpm)
100	1.8	0.0	0.0	12.1	1.3	0.0	39.0
1000	27.2	0.7	0.02	12.3	1.2	0.1	39.7
1800	54.9	0.8	0.05	12.6	0.8	0.4	34.3
2800	74.5	1.2	0.11	12.8	0.9	0.8	31.8
3600	92.1	2.2	0.10	10.8	0.8	0.3	28.3
3900	113.8	2.9	0.38	10.2	0.7	0.2	25.4
3950	128.0	4.0	0.88	10.3	0.6	0.6	24.8
4000	144.8	5.1	0.78	10.3	0.4	0.8	22.2
4500	142.5	9.1	1.80	15.7	0.7	1.0	17.8
5000	181.2	12.9	2.27	15.8	0.0	1.4	208.0
5500	202.0	14.5	2.9	11.7	0.0	1.2	238.2
6000	220.0	26.8	5.83	7.3	0.0	1.6	264.8
6400	242.0	40.0	8.94	5.1	0.0	1.7	336.0

Warm-up run (about 30 min.) is necessary for load current measurement.

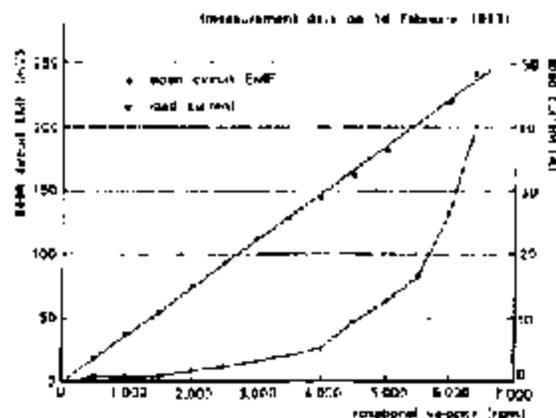


Figure 8. Open Circuit EMF and Load Current

Table 3. The Measurement Data of JPI- I

(measurement data on 7 March 1983)

rotation velocity (rpm)	N-machine			with load (near speed)			
	open EMF (mV)	load current (A)	load power (W)	rotation (rpm)	torque (Nm)	power (W)	load speed (rpm)
100	1.3	0.0	0.0	16.6	2.8	0.4	20.0
1000	21.5	1.0	0.1	16.6	2.8	0.4	20.8
1800	42.0	2.3	0.1	24.0	0.4	0.1	26.2
2400	52.0	3.8	0.3	34.1	0.1	0.1	18.2
2800	66.0	5.7	0.2	51.9	0.2	0.8	27.2
3000	76.0	8.8	0.2	36.2	0.0	0.2	117.4
3800	128.0	1.0	0.8	48.6	0.8	0.8	136.6
4000	143.0	2.8	0.4	64.6	0.6	1.0	151.8
4500	140.0	9.0	1.9	13.8	0.7	1.0	171.5
5000	180.0	18.6	3.3	8.7	0.0	1.0	207.5
5500	198.0	21.5	4.2	8.1	0.0	1.1	232.0
6000	218.0	34.4	6.3	7.8	0.0	1.1	255.4
6500	230.0	49.5	11.0	8.8	0.0	1.2	301.4
6900	240.0	39.0	8.8	6.8	0.0	1.7	336.0

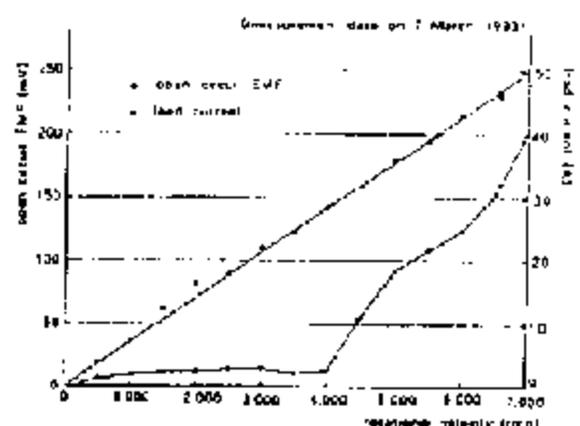


Figure 11. Open Circuit EMF and Load Current

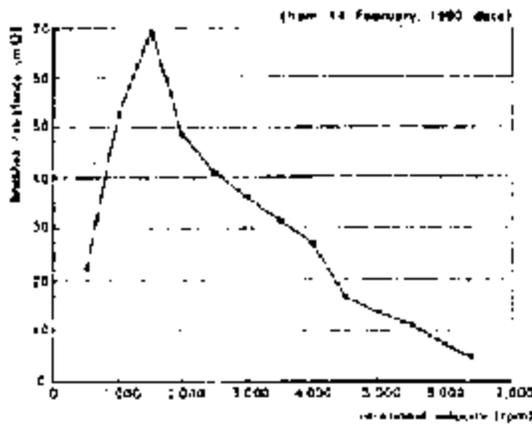


Figure 9. The Measurement of Brush Resistance

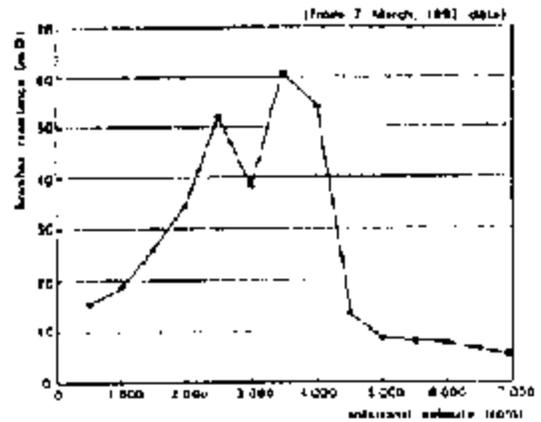


Figure 12. The Measurement of Brush Resistance

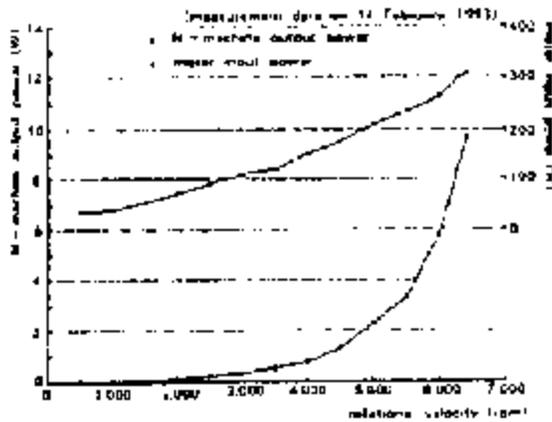


Figure 10. The Measurement of Electrical Power

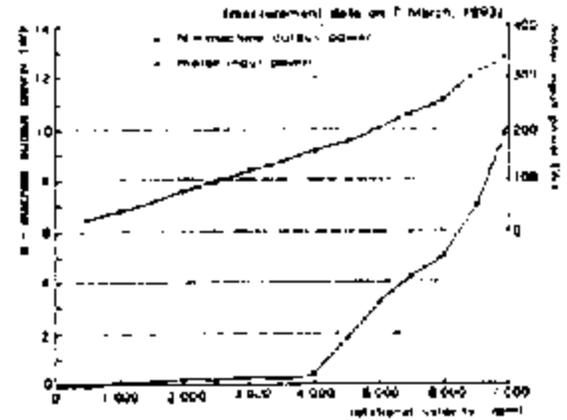


Figure 13. The Measurement of Electrical Power

Table 4. The Measurement of Back Torque

(measurement data on 7 March, 1993)

rotational velocity (rpm)	N-Machine open circuit mode			N-Machine close circuit mode		
	N-Machine	drive motor power supply		N-Machine	drive motor power supply	
	open EMF (mV)	voltage (V)	current (A)	load cur. (A)	voltage (V)	current (A)
6002	215	22.2	11.8	27.0	22.1	12.0
7032	258	26.1	12.7	41.2	26.1	13.1
7100	258	26.1	12.4	33.7	26.0	12.8
6000	215	21.9	11.6	21.0	21.9	11.8

rotational velocity (rpm)	N-Machine output power (W)	power increment of rotor supply (W)	
		the efficiency of the DC drive motor	
		100%	80%
6002	5.8	3.2	2.6
7032	10.5	10.4	8.3
7100	8.6	9.2	5.5
6000	4.5	4.4	3.5

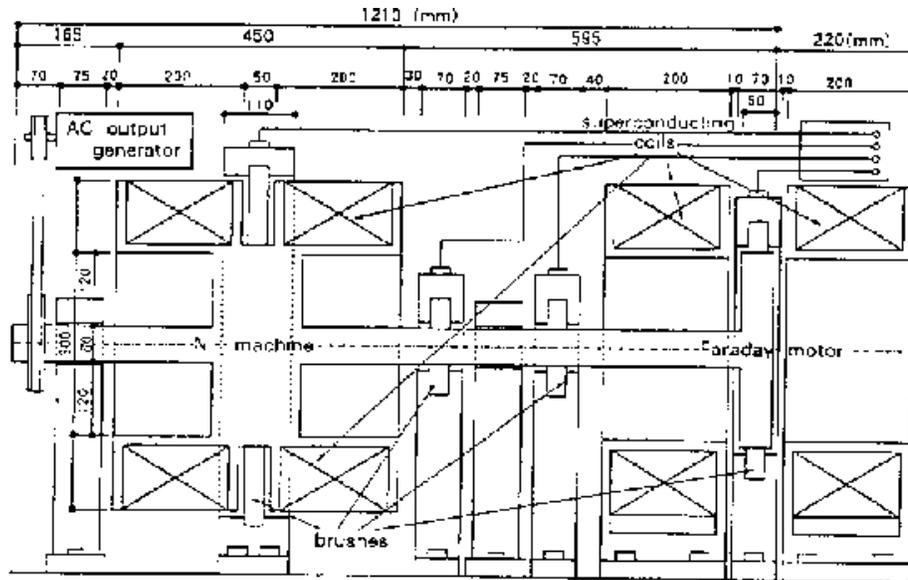


Figure 14. Conceptual Figure Of JPI-E Test Machine

DC power supply: A DC power supply of low voltage and large current is used to energize the super-conducting coils and for starting the machine.

The vacuum electrical power vs. rotational velocity were estimated for two cases (30cm and 50cm diameter, 4 Tesla magnet) in Table 6, 7 and Fig. 15. Moreover, we estimated the expected torque of Faraday motor for 30cm diameter case (Table 8). We estimate that the self-sustaining condition would be met in 5,000 (rpm) in this case.

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Conditions for output power estimation:

Open EMF : $V = (1/2) \omega B (r_2^2 - r_1^2)$ (V)

Magnetic flux density : $B = 4.0$ (T)

Load resistance : $R = 1$ (m Ω)

(using MKSA unit system)

Table 5. Specifications of JPI- II

Type	single rotor type
Diameter	300 (mm)
Rotor material	copper
Magnetic field	generated by super-conducting coil
Magnetic flux density	4 (T) (average density on the copper disk)
Maximum rotational velocity	8,000 (rpm)
Maximum output power · EMF · current	40 (V) 7,000 (A)
Brushes · material · cross section	copper-carbon 30×55 (mm) (periphery of disk : six pieces) (periphery of axis : two pieces)
DC power supply · maximum voltage · maximum current	50 (V) 7,000 (A)
Electrical generator	AC generator

On the other hand, recent astronomical findings indicate that our earth travels with speed 600 km/sec relative to the Lorentz ether. As rotational motion is "absolute", N-machine theory is valid for the experiments on the earth as confirmed by our experiments.

Table 6. Estimated Electrical Output Power

Rotation disk diameter : 30 (cm)
 (r_1 (inner radius) = 3 (cm) : r_2 (outer radius) = 15(cm))

rotation velocity (rpm)	V (V) (open EMF)	I (A) (load current)	W (kw) (output power)
3000	13.57	365.1	4.95
4000	18.10	649.6	11.76
5000	22.62	1559.6	35.28
6000	27.14	3269.9	88.72

Table 7. Estimated Electrical Output Power

Rotation disk diameter : 50 (cm)
 (r_1 (inner radius) = 3 (cm) : r_2 (outer radius) = 25(cm))

rotation velocity (rpm)	V (V) (open EMF)	I (A) (load current)	W (kw) (output power)
3000	20.42	549.4	11.22
4000	27.23	977.2	26.61
5000	34.03	2346.2	79.84
6000	40.84	4919.4	200.91

Conclusions

In view of the experimental results and theoretical considerations which were obtained and described above, we have concluded that the N-machine provides a basis for "space power generation", in that under certain conditions the extraction of electrical output energy is not reflected as a corresponding mechanical load to the driving source. The complaint of small EMF of JPI-I is not the case for a

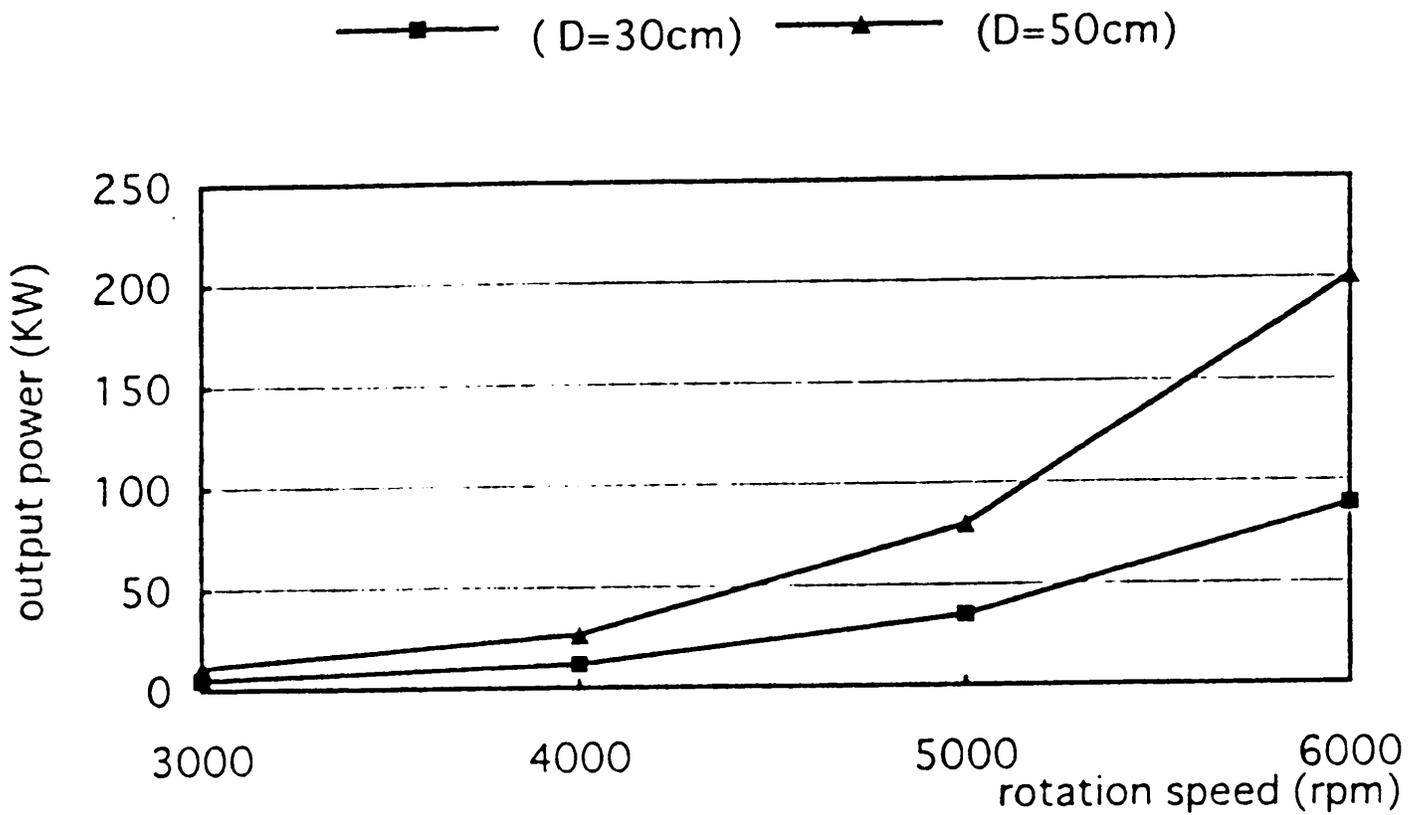


Figure 15. Estimated Electrical Output Power

Table 8. Estimated Faraday Motor Torque

Conditions : $B = 4.0$ (T) : magnetic flux density
 $r_1 = 0.03$ (m) : inner radius
 $r_2 = 0.15$ (m) : outer radius

rotation velocity (rpm)	supply current (A)	estimated torque (N · m)
3000	365.1	15.8
4000	649.6	28.1
5000	1559.6	67.4
6000	3269.9	141.3

bigger and stronger magnet N-machine, which utilizes not only neodymium magnets, but also super-conducting magnets.

All these experimental and theoretical developments strongly indicated that the simple mechanistic picture of basic building blocks of nature had to be abandoned. Furthermore, we are confident that this new paradigm and its application may bring the technological breakthrough for solving the energy crisis and the environmental holocaust.

Acknowledgements

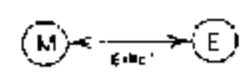
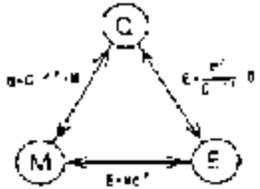
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Appendix : New versus Old Paradigms

Old Paradigm	New Paradigm
Newtonian mechanics	Newton's Mechanics
1st law: law of inertia 2nd law: system of motion $\frac{d^2x}{dt^2} = F(T, x, v, \text{external field})$ 3rd law: law of action and reaction Gravitation: $F = \frac{GM_1M_2}{r^2}$	1st law: law of inertia 2nd law: equation of motion $\frac{d^2x}{dt^2} = F(T, x, v, m, \text{external mass})$ 3rd law: law of action and reaction Above laws are effective only if mass is not massless or zero function GR-gravitation: $F = \frac{2GM_1M_2}{r^2}$ $Q_1 = G^2M_1$ $Q_2 = G^2M_2$
Electromagnetic equations (CGS unit in vacuum)	Electromagnetic differential equation (CGS unit in vacuum)
$\nabla \cdot E = 4\pi\rho, \nabla \times E = -\dot{B}$ $\nabla \cdot B = 0, \nabla \times B = \frac{1}{c}\dot{E} + \frac{4\pi}{c}j$	$\nabla \cdot E_1 + iE_2 = N = N_1 + iN_2$ $\nabla \times E_1 + iE_2 = -\dot{B}_1 + i\dot{B}_2$ $\nabla \cdot B_1 + iB_2 = 0, \nabla \times B_1 + iB_2 = \frac{1}{c}\dot{E}_1 + \frac{4\pi}{c}j_1 + i\frac{4\pi}{c}j_2$ The above equations indicate electromagnetic field
	$\nabla \cdot (H_1) = 4\pi j_{\text{ext}}$ $\nabla \times (H_1) = \frac{1}{c}\dot{E}_1 + \frac{4\pi}{c}j_1$ $\nabla \cdot (E_2) = 0$ $\nabla \times (E_2) = -\dot{B}_2 = -\frac{1}{c}\dot{H}_2 = \frac{4\pi}{c}j_2$ The above equations indicate gravitational field
General relativity	General relativity
$\square g = -4\pi\rho$ $\square x = -\frac{4\pi}{c}j$ $\square \phi = -\frac{1}{c^2}\dot{E}$ Lorentz condition $\nabla \cdot j = \frac{1}{c}\dot{\rho} = 0$	$\square g = -4\pi\rho, \square \phi = 0$ $\square A = -\frac{4\pi}{c}j, \square \psi = 0$ $\square \psi = -\frac{1}{c^2}\dot{E}, \square \psi = 0$ Complex Lorentz condition $\nabla \cdot j = \frac{1}{c}\dot{\rho} = 0$
Integration theory of electromagnetism and gravity	Integration theory of electromagnetism and gravity
	$\square g = -4\pi\rho$ $\square A = -\frac{4\pi}{c}j$ $\square \psi = -\frac{1}{c^2}\dot{E}$ $\rho = 0, G^2M_1 + (G^2M_2 - G^2M_1)$ $j = j_1 + j_2$ $M = M_1 + iM_2$ complex mass.
Thermodynamics	Complex thermo-dynamics
	Complex temperature $T = T_1 + iT_2$ Complex mass quantity $Q = Q_1 + iQ_2$

Einstein $E = mc^2$	Einstein $E = mc^2, E = hf$ $E_1 = \frac{h^2 Q_1}{T_1}$ $E_2 = \frac{h^2 Q_2}{T_2}$
Quantum mechanics (elementary particle theory)	Quantum mechanics (elementary particle theory)
Schrodinger equation $\nabla^2 \psi = -k^2 \psi$	Schrodinger equation $\nabla^2 \psi = -k^2 \psi$ Shadow Schrodinger equation $\nabla^2 \psi = -k^2 \psi$
Klein-Gordon equation $\square \psi = -m^2 \psi$	Klein-Gordon equation $\square \psi = -m^2 \psi$ Shadow Klein Gordon equation $\square \psi = -m^2 \psi$
Dirac equation $\gamma^\mu \partial_\mu \psi = m \psi$	Dirac equation $\gamma^\mu \partial_\mu \psi = m \psi$ Shadow Dirac equation $\gamma^\mu \partial_\mu \psi = m \psi$ Shadow Dirac equation $\gamma^\mu \partial_\mu \psi = m \psi$ (Integral unit)
Euler equation $\square \psi = -m^2 \psi = 0$ (Using interaction)	Euler equation $\square \psi = -m^2 \psi = 0$ (Using interaction)
	Shadow Euler equation $\square \psi = -m^2 \psi = 0$ (CGS unit) (CGS unit)
Space-time	Space-time
$E = mc^2$	$E = mc^2$ $E = mc^2$
Conversion formula: matter into energy	Conversion formula: conversion into mass and energy
$E = mc^2$ 	
	E.g. In the diagram of symbol please confer with the text