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Analysis in statistical quantum mechanics prism latency and real time evolution

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Abstract
From the Hamiltonian effect, it is possible to move to the study of statistical quantum mechanics from the calibration theory with the Su (2) group. An effective Hamiltonian effect has been taken up to degree 6, which means moving to the study of 3 particles that are independent of space (9 harmonic vibrations, i.e. degrees of freedom). From the study of an infinite number of particles and degrees of freedom (plasma of gluons and quarks).
After that, the inhomogeneous formulas were quantified, then Wagner's formula was applied [16], and we concluded the relationship of the evolution of the colored electric energy and the real time of the colored magnetic energy.
Keywords: non-equilibrium state semi-classical diffusion, in quantum field theory disequilibrium, phase transition of plasma gluons and quarks, in real-time non-equilibrium states.

Keywords: Quantum mechanics, real time evolution, prism latency

Introduction
Our conception of matter is based on the existence of two main classes of elementary particles, leptons and quarks [1], along with three of the four fundamental forces: electromagnetism, strong and weak interactions, and gravity, which we will leave aside for now. Quarks made up of neutrons and protons generate and are affected by these three forces. As for the leptons, like the electron, it is not affected by the strong force. The characteristic that distinguishes between these two categories, which represents the electric charge, is that quarks have colors, but leptons have no color, and quarks have colors, which are red, green, and blue.
The strong nuclear force results from the necessity that the equations that describe the quarks have nothing to do with how the colors of the quarks are defined. The strong force yields eight elementary particles, the gluons. The remaining two photons, the electromagnetic and weak nuclear forces, which are together called the electroweak force, depend on different symmetry. The electroweak forces carry four particles: a photon, a z0 boson, a w+ boson, and a w- boson.
Moving colored elementary particles (gluons and quarks) QCD is a strong mutual influence theory that describes stable confinement of gluons and quarks at a low temperature and the bulk plasma phase transition of gluons and quarks at a sufficiently high temperature. Many researchers have studied plasmas of gluons and quarks [2-13], all of which are based on QCD theory and quantum mechanics. There are researches that depend on the QCDt theory, that is, at high or non-zero temperatures, and also rely on statistical quantum mechanics [13-17].
In [13] we find that after quantifying the inhomogeneous formulas of the calibration field by approximating one turn, the results of which were numerical constants, that the study moved from the theory of pure calibration with the group SU (2), that is, from the quantization of the relative calibration fields to the study of statistical quantum mechanics with the group SU (2) This means, physically, that we have moved from studying an infinite number of particles and degrees of freedom (associated with the state of plasma, gluons and quarks) to studying three global particles, that is, nine degrees of freedom, and specifically nine non-harmonic vibrations.
In [14-15], the evolution of the real times of quarks and gluons plasma was studied for the sake of the net calibration theory with the two groups SU (2), SU (3), and the perturbation theory was used depending on the building effect and the demolition effect.
However, the effective Hamiltonian effect publication was taken up to degree 4 only. As for [16-17], the evolution of the real times of the plasma of gluons and quarks was studied for the pure calibration theory or the calibration theory with the two groups SU (2), SU (3), and the

semi-diffusion method was used The traditional model based on the application of the Wagner formula, but taking the prism effective Hamiltonian up to degree 4 only.

As for our research, we will take the effective Hamiltonian prism up to degree 6 [18] and we will rely on the semi-traditional diffusion method by applying the Wagner formula [16]. And the gluons in the calibration theory with the SU (2) group to the study of a system consisting of three particles, that is, nine degrees of freedom with mutual effect, specifically nine non-harmonic vibrations, and we calculated all the quantum corrections, that is, we got the complete quantum solution from the semi-conventional publication.

We have taken the Hamiltonian operator prism up to degree 6 because the potential prism up to degree 4 does not describe the potential over the entire field and we see this in Figure (1) where there is no boundary limit. As for the latency prism up to the 6th degree, it describes the latency on the entire field, and we see this in Figure (2), where there is a small boundary end, and therefore the quarks and gluons are found at the bottom, and we call that hadrons, and therefore we need quarks and gluons for high energy in order to be liberated and become free.

Research importance and objectives

What we will do in this work is to develop a mathematical method to study the real-time evolution in cases of imbalance in calibration theory [2-18]. Quarks and gluons. This method is based on a combination of two processes: the first is the use of the back field method and the one-lap approximation, and the second is the semi-conventional sawing by the Wagner method when the perturbation theory cannot be applied.

The research aims to find the real time evolution in the statistical quantum mechanics of the calibration theory with the SU (2) group with the potential prism up to the 6th degree.

Research methods and materials

Hamiltonian operator

The effective potential prism up to the sixth degree gives an approximation of one spin in the presence of quarks according to reference [18] with the relation:

$$V_{\text{eff}(1)} = \tilde{\alpha}_1 B_i^a B_i^a + \frac{1}{4}\left(\frac{1}{g^2(L)} + \tilde{\alpha}_2\right) F_{ij}^a(B) F_{ij}^a(B)$$
$$+\tilde{\alpha}_3 B_i^a B_i^a B_j^b B_j^b + \tilde{\alpha}_4 B_i^a B_i^a B_i^b B_i^b + \tilde{\alpha}_5 \sum_i (B_i^a B_i^a)^3$$
$$+\tilde{\alpha}_6 \sum_{i\neq j} (B_i^a B_i^a)^2 B_j^b B_j^b + \tilde{\alpha}_7 B_1^a B_1^a B_2^a B_2^a B_3^a B_3^a + \tilde{\alpha}_8 F_{ij}^a(B) F_{ij}^a(B) B_k^b B_k^b$$
$$+\tilde{\alpha}_9 F_{ij}^a(B) F_{ij}^a(B) B_j^b B_j^b + \tilde{\alpha}_{10} (B_1^a B_2^a B_3^a)^2 + 0(B^8)$$

The index 1 in eff (1) stands for the one-lap approximation.

I, j, k = 1, 2, 3 Spatial coordinates directory.

A, b=1, 2, 3 Evidence generating the group SU (2).

The Hamiltonian effect of the sentence is according to the reference [18] in the form:

$$\hat{H}_{eff} = \frac{1}{2}\left(\frac{1}{g^2(L)} + \tilde{\alpha}_0\right)^{-1} \hat{\Pi}_i^a \hat{\Pi}_i^a + \tilde{\alpha}_1 \hat{B}_i^a \hat{B}_i^a + \frac{1}{4}\left(\frac{1}{g^2(L)} + \tilde{\alpha}_2\right) \hat{F}_{ij}^a(B) \hat{F}_{ij}^a(B)$$

$$+\tilde{\alpha}_3 \hat{B}_i^a \hat{B}_i^a \hat{B}_j^b \hat{B}_j^b + \tilde{\alpha}_4 \hat{B}_i^a \hat{B}_i^a \hat{B}_i^b \hat{B}_i^b + \tilde{\alpha}_5 \sum_i \left(\hat{B}_i^a \hat{B}_i^a\right)^3$$
$$+\tilde{\alpha}_6 \sum_{i\neq j} \left(\hat{B}_i^a \hat{B}_i^a\right)^2 \hat{B}_j^b \hat{B}_j^b + \tilde{\alpha}_7 \hat{B}_1^a \hat{B}_1^a \hat{B}_2^a \hat{B}_2^a \hat{B}_3^a \hat{B}_3^a + \tilde{\alpha}_8 \hat{F}_{ij}^a(B) \hat{F}_{ij}^a(B) \hat{B}_k^b \hat{B}_k^b$$
$$+\tilde{\alpha}_9 \hat{F}_{ij}^a(B) \hat{F}_{ij}^a(B) \hat{B}_j^b \hat{B}_j^b + \tilde{\alpha}_{10} \left(\hat{B}_1^a \hat{B}_2^a \hat{B}_3^a\right)^2 + 0\left(\hat{B}^8\right) \quad (*)$$

Depending on the relationship:

$$\tilde{\alpha}_m = \alpha_m + n_f f_m$$

Note that m is from 0 to 10, so the relationship becomes (*) in the form:

$$\begin{aligned}\hat{H}_{eff} = &\frac{1}{2}\left(\frac{1}{g^2(L)} + \alpha_0 + n_f f_0\right)^{-1} \hat{\Pi}_i^a \hat{\Pi}_i^a + (\alpha_1 + n_f f_1)\hat{B}_i^a \hat{B}_i^a \\ &+ \frac{1}{4}\left(\frac{1}{g^2(L)} + \alpha_2 + n_f f_2\right)\hat{F}_{ij}^a(B)\hat{F}_{ij}^a(B) \\ &+(\alpha_3 + n_f f_3)\hat{B}_i^a \hat{B}_i^a \hat{B}_j^b \hat{B}_j^b + (\alpha_4 + n_f f_4)\hat{B}_i^a \hat{B}_i^a \hat{B}_i^b \hat{B}_i^b + (\alpha_5 + n_f f_5)\sum_i \left(\hat{B}_i^a \hat{B}_i^a\right)^3 \\ &+(\alpha_6 + n_f f_6)\sum_{i \neq j}\left(\hat{B}_i^a \hat{B}_i^a\right)^2 \hat{B}_j^b \hat{B}_j^b + (\alpha_7 + n_f f_7)\hat{B}_1^a \hat{B}_1^a \hat{B}_2^a \hat{B}_2^a \hat{B}_3^a \hat{B}_3^a \\ &+ (\alpha_8 + n_f f_8)\hat{F}_{ij}^a(B)\hat{F}_{ij}^a(B)\hat{B}_k^b \hat{B}_k^b \\ &+(\alpha_9 + n_f f_9)\hat{F}_{ij}^a(B)\hat{F}_{ij}^a(B)\hat{B}_j^b \hat{B}_j^b + (\alpha_{10} + n_f f_{10})\left(\hat{B}_1^a \hat{B}_2^a \hat{B}_3^a\right)^2 + 0\left(\hat{B}^8\right) \end{aligned} \quad (1)$$

Nf=3 The number of types of quarks for the SU (2) group.
B means that we have neglected terms of higher order than B6.
In this way, we have transferred the study from the theory of calibration with the group SU (2), that is, from the quantization of the relative calibration fields to the study of statistical quantum mechanics with the group SU (2).
A1…a10 [18] Numerical constants resulting from the quantization of the inhomogeneous fields of the gluons in the path integration method, that is, they represent the contribution of these inhomogeneous fields to the potential energy (colored magnetic energy).
F1..f10 [18] Numerical constants resulting from the quantization of the fields of inhomogeneous quarks by the path integration method, that is, they represent the contribution of these inhomogeneous fields to the potential energy (colored magnetic energy)**.**
A0 [18] is a numerical constant resulting from the quantization of the time derivative of the heterogeneous gluon fields by the method of path integration, that is, it represents the contribution of the time derivatives of these fields to the kinetic energy (colored electric energy).
F0 [18] is a numerical constant resulting from the quantization of the time derivative of the fields of inhomogeneous quarks by the path integration method, that is, it represents the contribution of the time derivatives of these fields to the kinetic energy (colored electric energy).
And it has the values:

$$\begin{aligned} \alpha_0 = 0.021810429, \alpha_1 = -0.30104661, \alpha_2 = 0.0075714590 \\ \alpha_3 = 0.00639504288, \alpha_4 = -0.0078439275, \alpha_5 = 0.000049676959 \\ \alpha_6 = -0.000055172502, \alpha_7 = -0.0012423581, \alpha_8 = -0.00011130266 \\ \alpha_9 = -0.00021475176, \alpha_{10} = -0.0012775652 \end{aligned}$$

$$\begin{aligned} f_0 = -0.00006196422, f_1 = 0.042544024, f_2 = -0.0034423844 \\ f_3 = 0.000739942998, f_4 = -0.001585048, f_5 = 0.0000057319312 \\ f_6 = -0.000023157326, f_7 = 0.000158894984, f_8 = -0.000060357572 \\ f_9 = -0.000064313046, f_{10} = 0.000064543472 \end{aligned}$$

We notice that some values of the am constants differ from the pure calibration case due to the mutual influence between quarks and gluons**.**

$$F_{ij}^a = \varepsilon^{abc} B_i^b B_j^c (\mathrm{i})$$

where B is the homogeneous magnetic field operator
Π is the height operator
ε is 1 for direct switching, 0 for equal indices, and -1 for indirect switching**.**
G is the correlation constant that defines the interaction between gluons and its relationship:

$$\begin{aligned} g^{-2}(L) &= -2b_0 \ln(L\Lambda_{ms}) + \frac{b_1 \ln[-2\ln(L\Lambda_{ms})]}{2b_0^2} \\ b_0 &= \frac{1}{(4\pi)^2}\left(\frac{\pi}{3}N - \frac{2}{3}n_f\right) \\ b_1 &= \frac{1}{(4\pi)^4}\left(-\frac{34}{3}N^2 + \frac{10}{3}Nn_f + (N^2-1)n_f/N\right) \end{aligned}$$

A=74.1 Mev is a constant defined by minimal subtraction to organize the dimensions.
N=2 the number of dimensions of the SU (2) group
Semi-classical publishing:
Depending on relation (1) and applying the Wagner formula [16] to relation (1), we get the Wagner equivalent of the effective Hamiltonian up to degree 6, which is:

$$H_{eff}^{w} = \frac{1}{2}\left(\frac{1}{g^2(L)}+\alpha_0+n_f f_0\right)^{-1}\Pi_i^a\Pi_i^a+(\alpha_1+n_f f_1)B_i^aB_i^a + \frac{1}{4}\left(\frac{1}{g^2(L)}+\alpha_2+n_f f_2\right)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_j^cB_i^dB_j^e + (\alpha_3+n_f f_3)B_i^aB_i^aB_j^bB_j^b+(\alpha_4+n_f f_4)B_i^aB_i^aB_i^bB_i^b+(\alpha_5+n_f f_5)\sum_i(B_i^aB_i^a)^3 + (\alpha_6+n_f f_6)\sum_{i\neq j}(B_i^aB_i^a)^2B_j^bB_j^b+(\alpha_7+n_f f_7)B_1^aB_1^aB_2^aB_2^aB_3^aB_3^a + (\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_j^cB_i^dB_j^eB_k^bB_k^b+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_j^cB_i^dB_j^eB_j^bB_j^b + (\alpha_{10}+n_f f_{10})(B_1^aB_2^aB_3^a)(B_1^aB_2^aB_3^a)+0(B^8)$$

And we found the Heisenberg derivative with respect to the Wagner equivalent time:

$$\frac{\partial \mathcal{O}_w(B,\Pi,t)}{\partial t}=\frac{2}{\hbar}H_w\sin\left(\frac{\hbar\Lambda}{2}\right)\mathcal{O}_w(B,\Pi,t) \qquad (3)$$

By spreading sin and being satisfied with the first three terms (because from the fourth term, the derivatives of the Wagner equivalent of the effective Hamiltonian effect become equal to zero, and the relationship becomes (3):

$$\frac{\partial \mathcal{O}_w(B,\Pi,t)}{\partial t}=\frac{2}{\hbar}H_w\left(\frac{\hbar\Lambda}{2}-\frac{\hbar^3\Lambda^3}{2^3 3!}+\frac{\hbar^5\Lambda^5}{2^5 5!}\right)\mathcal{O}_w(B,\Pi,t) \qquad (4)$$
$$=\left[H_w(B,\Pi,t)\Lambda-\frac{\hbar^2}{24}H_w(B,\Pi,t)\Lambda^3+\frac{\hbar^4}{1920}H_w(B,\Pi,t)\Lambda^5\right]\mathcal{O}_w(B,\Pi,t)$$

where A is the Poisson arc operator and its relation:

$$\hat{\Lambda}=\sum_{i=1}^{3}\sum_{a=1}^{3}\left[\frac{\overleftarrow{\partial}}{\partial\Pi_i^a}\frac{\overrightarrow{\partial}}{\partial B_i^a}-\frac{\overleftarrow{\partial}}{\partial B_i^a}\frac{\overrightarrow{\partial}}{\partial\Pi_i^a}\right] \qquad (5)$$

And we calculate the components of the relationship (4):

$$1)\ H_w(B,\Pi,t)\Lambda=\left(\frac{1}{g^2(L)}+\alpha_0+n_f f_0\right)^{-1}\Pi_i^a\frac{\partial}{\partial B_i^a} - \Big[2(\alpha_1+n_f f_1)B_i^a+\frac{1}{2}\left(\frac{1}{g^2(L)}+\alpha_2+n_f f_2\right)\varepsilon^{fac}\varepsilon^{fde}(B_j^cB_j^eB_i^d-B_j^cB_j^dB_i^e) + 4(\alpha_3+n_f f_3)B_i^aB_j^bB_j^b+4(\alpha_4+n_f f_4)B_i^aB_i^bB_i^b+6(\alpha_5+n_f f_5)\sum_i B_i^a(B_i^aB_i^a)^2 + 4(\alpha_6+n_f f_6)\sum_{i\neq j}B_i^aB_i^aB_i^aB_j^bB_j^b+(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}(B_j^cB_j^eB_i^d-B_j^cB_j^dB_i^e)B_k^bB_k^b + (\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}(B_j^cB_j^eB_i^d-B_j^cB_j^dB_i^e)B_j^bB_j^b\Big]\frac{\partial}{\partial\Pi_i^a} - 2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_j^eB_k^b\,B_k^b\frac{\partial}{\partial\Pi_j^c}-2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_j^cB_i^dB_j^eB_k^b\frac{\partial}{\partial\Pi_k^b} - 4(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_j^eB_j^bB_j^b\frac{\partial}{\partial\Pi_j^c}$$

$$-2\left(\left(\alpha_7+n_f f_7\right)+\left(\alpha_{10}+n_f f_{10}\right)\right)B_1^aB_2^aB_2^aB_3^aB_3^a\frac{\partial}{\partial\Pi_1^a}$$

$$-2\left(\left(\alpha_7+n_f f_7\right)+\left(\alpha_{10}+n_f f_{10}\right)\right)B_1^aB_1^aB_2^aB_3^aB_3^a\frac{\partial}{\partial\Pi_2^a}$$

$$-2\left(\left(\alpha_7+n_f f_7\right)+\left(\alpha_{10}+n_f f_{10}\right)\right)B_1^aB_1^aB_2^aB_2^aB_3^a\frac{\partial}{\partial\Pi_3^a} \tag{6}$$

2) $-\frac{\hbar^2}{24}H_w(B,\Pi,t)\Lambda^3$

$$= \hbar^2\left[\frac{1}{4}\left(\frac{1}{g^2(L)}+\alpha_2+n_f f_2\right)\varepsilon^{fac}\varepsilon^{fde}B_j^c\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_i^d\partial\Pi_j^e}\right.$$

$$+(\alpha_3+n_f f_3)B_i^a\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_j^b\partial\Pi_j^b}+(\alpha_4+n_f f_4)B_i^a\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_i^b\partial\Pi_i^b}$$

$$+5(\alpha_5+n_f f_5)\sum_i B_i^aB_i^aB_i^a\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_i^a\partial\Pi_i^a}+(\alpha_6+n_f f_6)\sum_{i\neq j}B_i^aB_j^bB_j^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_i^a\partial\Pi_i^a}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_2^aB_3^aB_3^a\frac{\partial^3}{\partial\Pi_1^a\partial\Pi_1^a\partial\Pi_2^a}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_2^aB_2^aB_3^a\frac{\partial^3}{\partial\Pi_1^a\partial\Pi_1^a\partial\Pi_3^a}$$

$$+\frac{1}{2}\left(\left(\alpha_7+n_f f_7\right)+\left(\alpha_{10}+n_f f_{10}\right)\right)B_1^aB_3^aB_3^a\frac{\partial^3}{\partial\Pi_1^a\partial\Pi_2^a\partial\Pi_2^a}$$

$$+2\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^aB_2^aB_3^a\frac{\partial^3}{\partial\Pi_1^a\partial\Pi_2^a\partial\Pi_3^a}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^aB_2^aB_2^a\frac{\partial^3}{\partial\Pi_1^a\partial\Pi_3^a\partial\Pi_3^a}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^aB_1^aB_3^a\frac{\partial^3}{\partial\Pi_2^a\partial\Pi_2^a\partial\Pi_3^a}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^aB_1^aB_2^a\frac{\partial^3}{\partial\Pi_2^a\partial\Pi_3^a\partial\Pi_3^a}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^d\,B_k^bB_k^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_j^e}$$

$$+2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^dB_j^eB_k^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^cB_j^eB_k^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_i^d\partial\Pi_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^cB_i^dB_j^e\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_k^b\partial\Pi_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_k^b\frac{\partial^3}{\partial\Pi_j^c\partial\Pi_j^e\partial\Pi_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_j^e\frac{\partial^3}{\partial\Pi_j^c\partial\Pi_k^b\partial\Pi_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^eB_k^bB_k^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_i^d}+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_j^b\frac{\partial^3}{\partial\Pi_j^c\partial\Pi_j^e\partial\Pi_j^b}$$

$$\left.+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_j^eB_j^bB_j^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_i^d}+3(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^dB_j^bB_j^b\frac{\partial^3}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_j^e}\right]$$

(7

$$3) + \frac{\hbar^4}{1920} H_w(B, \Pi, t)\Lambda^5 =$$

$$\hbar^4 \left[-\frac{3}{8}(\alpha_5 + n_f f_5) \sum_i B_i^a \frac{\partial^5}{\partial \Pi_i^a \partial \Pi_i^a \partial \Pi_i^a \partial \Pi_i^a \partial \Pi_i^a} \right.$$
$$- \frac{1}{8}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_k^b \frac{\partial^5}{\partial \Pi_i^a \partial \Pi_j^c \partial \Pi_i^d \partial \Pi_j^e \partial \Pi_k^b}$$
$$- \frac{1}{8}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_j^e \frac{\partial^5}{\partial \Pi_i^a \partial \Pi_j^c \partial \Pi_i^d \partial \Pi_k^b \partial \Pi_k^b}$$
$$- \frac{1}{8}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^d \frac{\partial^5}{\partial \Pi_i^a \partial \Pi_j^c \partial \Pi_j^e \partial \Pi_k^b \partial \Pi_k^b}$$
$$- \frac{1}{4}(\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde} B_j^b \frac{\partial^5}{\partial \Pi_i^a \partial \Pi_j^c \partial \Pi_i^d \partial \Pi_j^e \partial \Pi_j^b}$$
$$- \frac{1}{8}(\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde} B_i^d \frac{\partial^5}{\partial \Pi_i^a \partial \Pi_j^c \partial \Pi_j^e \partial \Pi_j^b \partial \Pi_j^b}$$

$$- \frac{1}{8}\Big((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\Big) B_3^a \frac{\partial^5}{\partial \Pi_1^a \partial \Pi_1^a \partial \Pi_2^a \partial \Pi_2^a \partial \Pi_3^a}$$
$$- \frac{1}{8}\big((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\big) B_2^a \frac{\partial^5}{\partial \Pi_1^a \partial \Pi_1^a \partial \Pi_2^a \partial \Pi_3^a \partial \Pi_3^a}$$
$$- \frac{1}{8}\big((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\big) B_1^a \frac{\partial^5}{\partial \Pi_1^a \partial \Pi_2^a \partial \Pi_2^a \partial \Pi_3^a \partial \Pi_3^a} \Bigg] \qquad (8)$$

We substitute (6), (7), and (8) into (4), and we get:

$$\frac{\partial \mathcal{O}_w}{\partial t} = \Bigg\{ \Bigg[\left(\frac{1}{g^2(L)} + \alpha_0 + n_f f_0 \right)^{-1} \Pi_i^a \frac{\partial}{\partial B_i^a}$$
$$- \Big[2(\alpha_1 + n_f f_1) B_i^a + \frac{1}{2}\left(\frac{1}{g^2(L)} + \alpha_2 + n_f f_2 \right) \varepsilon^{fac}\varepsilon^{fde}\big(B_j^c B_j^e B_i^d - B_j^c B_j^d B_i^e\big)$$
$$+ 4(\alpha_3 + n_f f_3) B_i^a B_j^b B_j^b + 4(\alpha_4 + n_f f_4) B_i^a B_i^b B_i^b + 6(\alpha_5 + n_f f_5) \sum_i B_i^a (B_i^a B_i^a)^2$$
$$+ 4(\alpha_6 + n_f f_6) \sum_{i \neq j} B_i^a B_i^a B_i^a B_j^b B_j^b + (\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\big(B_j^c B_j^e B_i^d - B_j^c B_j^d B_i^e\big) B_k^b B_k^b$$
$$+ (\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\big(B_j^c B_j^e B_i^d - B_j^c B_j^d B_i^e\big) B_j^b B_j^b \Big] \frac{\partial}{\partial \Pi_i^a}$$
$$- 2(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^a B_i^d B_j^e B_k^b B_k^b \frac{\partial}{\partial \Pi_j^c} - 2(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^a B_j^c B_i^d B_j^e B_k^b \frac{\partial}{\partial \Pi_k^b}$$

$$- 4(\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde} B_i^a B_i^d B_j^e B_j^b B_j^b \frac{\partial}{\partial \Pi_j^c}$$
$$- 2\big((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\big) B_1^a B_2^a B_2^a B_3^a B_3^a \frac{\partial}{\partial \Pi_1^a}$$
$$- 2\Big((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\Big) B_1^a B_1^a B_2^a B_3^a B_3^a \frac{\partial}{\partial \Pi_2^a}$$
$$- 2\Big((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\Big) B_1^a B_1^a B_2^a B_2^a B_3^a \frac{\partial}{\partial \Pi_3^a} \Bigg]$$
$$+ \hbar^2 \left[\frac{1}{4}\left(\frac{1}{g^2(L)} + \alpha_2 + n_f f_2 \right) \varepsilon^{fac}\varepsilon^{fde} B_j^c \frac{\partial^3}{\partial \Pi_i^a \partial \Pi_i^d \partial \Pi_j^e} \right.$$

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$$+ (\alpha_3 + n_f f_3) B_i^a \frac{\partial^3}{\partial \Pi_i^a \partial \Pi_j^b \partial \Pi_j^b} + (\alpha_4 + n_f f_4) B_i^a \frac{\partial^3}{\partial \Pi_i^a \partial \Pi_i^b \partial \Pi_i^b}$$
$$+ 5(\alpha_5 + n_f f_5) \sum_i B_i^a B_i^a B_i^a \frac{\partial^3}{\partial \Pi_i^a \partial \Pi_i^a \partial \Pi_i^a} + (\alpha_6 + n_f f_6) \sum_{i \neq j} B_i^a B_j^b B_j^b \frac{\partial^3}{\partial \Pi_i^a \partial \Pi_i^a \partial \Pi_i^a}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_2^a B_3^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_1^a \partial\Pi_2^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_2^a B_2^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_1^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^a B_3^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_2^a \partial\Pi_2^a}$$
$$+2\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^a B_2^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_2^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^a B_2^a B_2^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_3^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^a B_1^a B_3^a \frac{\partial^3}{\partial\Pi_2^a \partial\Pi_2^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^a B_1^a B_2^a \frac{\partial^3}{\partial\Pi_2^a \partial\Pi_3^a \partial\Pi_3^a}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^d B_k^b B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_j^e}$$

$$+2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^d B_j^e B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^c B_j^e B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_i^d \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^c B_i^d B_j^e \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_k^b \partial\Pi_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^a B_i^d B_k^b \frac{\partial^3}{\partial\Pi_j^c \partial\Pi_j^e \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^a B_i^d B_j^e \frac{\partial^3}{\partial\Pi_j^c \partial\Pi_k^b \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^e B_k^b B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d}+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^a B_i^d B_j^b \frac{\partial^3}{\partial\Pi_j^c \partial\Pi_j^e \partial\Pi_j^b}$$
$$+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_j^e B_j^b B_j^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d}+3(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^d B_j^b B_j^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_j^e}\Bigg]$$
$$+\hbar^4\Bigg[-\frac{3}{8}(\alpha_5+n_f f_5)\sum_i B_i^a \frac{\partial^5}{\partial\Pi_i^a \partial\Pi_i^a \partial\Pi_i^a \partial\Pi_i^a \partial\Pi_i^a}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_k^b \frac{\partial^5}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d \partial\Pi_j^e \partial\Pi_k^b}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^e \frac{\partial^5}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d \partial\Pi_k^b \partial\Pi_k^b}$$

$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^d \frac{\partial^5}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_j^e \partial\Pi_k^b \partial\Pi_k^b}$$
$$-\frac{1}{4}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_j^b \frac{\partial^5}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d \partial\Pi_j^e \partial\Pi_j^b}$$
$$-\frac{1}{8}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^d \frac{\partial^5}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_j^e \partial\Pi_j^b \partial\Pi_j^b}$$
$$-\frac{1}{8}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_3^a \frac{\partial^5}{\partial\Pi_1^a \partial\Pi_1^a \partial\Pi_2^a \partial\Pi_2^a \partial\Pi_3^a}$$
$$-\frac{1}{8}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_2^a \frac{\partial^5}{\partial\Pi_1^a \partial\Pi_1^a \partial\Pi_2^a \partial\Pi_3^a \partial\Pi_3^a}$$
$$-\frac{1}{8}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^a \frac{\partial^5}{\partial\Pi_1^a \partial\Pi_2^a \partial\Pi_2^a \partial\Pi_3^a \partial\Pi_3^a}\Bigg]\Bigg\}\mathcal{O}_w(B,\Pi,t)+0(\hbar^6)$$

Where 0(h6) means that the quantum corrections of the order of h6 and above are zero.

We write the solution back in the form of an integral differential equation:

$$\mathcal{O}_w(B,\Pi,t) = \mathcal{O}_{cl}(B,\Pi,t) + \left\{ \hbar^2 \int_0^t dt' \exp\left[(t-t')\widehat{H}_1\right] \right.$$
$$\left[\frac{1}{4}\left(\frac{1}{g^2(L)} + \alpha_2 + n_f f_2\right) \varepsilon^{fac}\varepsilon^{fde} B_j^c \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_i^d \partial\Pi_j^e}\right.$$
$$+(\alpha_3 + n_f f_3) B_i^a \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^b \partial\Pi_j^b} + (\alpha_4 + n_f f_4) B_i^a \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_i^b \partial\Pi_i^b}$$

$$+5(\alpha_5 + n_f f_5)\sum_i B_i^a B_i^a B_i^a \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_i^a \partial\Pi_i^a} + (\alpha_6 + n_f f_6)\sum_{i\neq j} B_i^a B_j^b B_j^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_i^a \partial\Pi_i^a}$$
$$+\frac{1}{2}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_2^a B_3^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_1^a \partial\Pi_2^a}$$
$$+\frac{1}{2}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_2^a B_2^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_1^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_1^a B_3^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_2^a \partial\Pi_2^a}$$
$$+2\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_1^a B_2^a B_3^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_2^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_1^a B_2^a B_2^a \frac{\partial^3}{\partial\Pi_1^a \partial\Pi_3^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_1^a B_1^a B_3^a \frac{\partial^3}{\partial\Pi_2^a \partial\Pi_2^a \partial\Pi_3^a}$$
$$+\frac{1}{2}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right) B_1^a B_1^a B_2^a \frac{\partial^3}{\partial\Pi_2^a \partial\Pi_3^a \partial\Pi_3^a}$$

$$+\frac{1}{2}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^d B_k^b B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_j^e}$$
$$+2(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^d B_j^e B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_j^c B_j^e B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_i^d \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_j^c B_i^d B_j^e \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_k^b \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^a B_i^d B_k^b \frac{\partial^3}{\partial\Pi_j^c \partial\Pi_j^e \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_i^a B_i^d B_j^e \frac{\partial^3}{\partial\Pi_j^c \partial\Pi_k^b \partial\Pi_k^b}$$
$$+\frac{1}{2}(\alpha_8 + n_f f_8)\varepsilon^{fac}\varepsilon^{fde} B_j^e B_k^b B_k^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d} + (\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde} B_i^a B_i^d B_j^b \frac{\partial^3}{\partial\Pi_j^c \partial\Pi_j^e \partial\Pi_j^b}$$

$$\left. +(\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde} B_j^e B_j^b B_j^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_i^d} + 3(\alpha_9 + n_f f_9)\varepsilon^{fac}\varepsilon^{fde} B_i^d B_j^b B_j^b \frac{\partial^3}{\partial\Pi_i^a \partial\Pi_j^c \partial\Pi_j^e}\right]$$
$$+\hbar^4 \int_0^t dt' \exp\left[(t-t')\widehat{H}_1\right]$$

$$\Big[-\frac{3}{8}(\alpha_5+n_f f_5)\sum_i B_i^a\frac{\partial^5}{\partial\Pi_i^a\partial\Pi_i^a\partial\Pi_i^a\partial\Pi_i^a\partial\Pi_i^a}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_k^b\frac{\partial^5}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_i^d\partial\Pi_j^e\partial\Pi_k^b}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_j^e\frac{\partial^5}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_i^d\partial\Pi_k^b\partial\Pi_k^b}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^d\frac{\partial^5}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_j^e\partial\Pi_k^b\partial\Pi_k^b}$$
$$-\frac{1}{4}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_j^b\frac{\partial^5}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_i^d\partial\Pi_j^e\partial\Pi_j^b}$$
$$-\frac{1}{8}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^d\frac{\partial^5}{\partial\Pi_i^a\partial\Pi_j^c\partial\Pi_j^e\partial\Pi_j^b\partial\Pi_j^b}$$
$$-\frac{1}{8}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_3^a\frac{\partial^5}{\partial\Pi_1^a\partial\Pi_1^a\partial\Pi_2^a\partial\Pi_2^a\partial\Pi_3^a}$$

$$-\frac{1}{8}((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10}))B_2^a\frac{\partial^5}{\partial\Pi_1^a\partial\Pi_1^a\partial\Pi_2^a\partial\Pi_3^a\partial\Pi_3^a}$$
$$-\frac{1}{8}((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10}))B_1^a\frac{\partial^5}{\partial\Pi_1^a\partial\Pi_2^a\partial\Pi_2^a\partial\Pi_3^a\partial\Pi_3^a}\Big]\Big\}\mathcal{O}_w(B,\Pi,t') \quad (9)$$

Where:

$$\hat{H}_1=\left(\frac{1}{g^2(L)}+\alpha_0+n_f f_0\right)^{-1}\Pi_i^a\frac{\partial}{\partial B_i^a}$$
$$-\Big[2(\alpha_1+n_f f_1)B_i^a+\frac{1}{2}\left(\frac{1}{g^2(L)}+\alpha_2+n_f f_2\right)\varepsilon^{fac}\varepsilon^{fde}(B_j^cB_j^eB_i^d-B_j^cB_j^dB_i^e)$$
$$+4(\alpha_3+n_f f_3)B_i^aB_j^bB_j^b+4(\alpha_4+n_f f_4)B_i^aB_i^bB_i^b+6(\alpha_5+n_f f_5)\sum_i B_i^a(B_i^aB_i^a)^2$$
$$+4(\alpha_6+n_f f_6)\sum_{i\neq j}B_i^aB_i^aB_i^aB_j^bB_j^b+(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}(B_j^cB_j^eB_i^d-B_j^cB_j^dB_i^e)B_k^bB_k^b$$
$$+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}(B_j^cB_j^eB_i^d-B_j^cB_j^dB_i^e)B_j^bB_j^b\Big]\frac{\partial}{\partial\Pi_i^a}$$
$$-2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_j^eB_k^b\,B_k^b\frac{\partial}{\partial\Pi_j^c}-2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_j^cB_i^dB_j^eB_k^b\frac{\partial}{\partial\Pi_k^b}$$
$$-4(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}B_i^aB_i^dB_j^eB_j^bB_j^b\frac{\partial}{\partial\Pi_j^c}$$
$$-2((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10}))B_1^aB_2^aB_2^aB_3^aB_3^a\frac{\partial}{\partial\Pi_1^a}$$

$$-2\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^aB_1^aB_2^aB_3^aB_3^a\frac{\partial}{\partial\Pi_2^a}$$
$$-2\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)B_1^aB_1^aB_2^aB_2^aB_3^a\frac{\partial}{\partial\Pi_3^a}$$

The exp(tH) operator generates the conventional motion:

$$exp(t\hat{H}_1)\mathfrak{f}(B,\Pi)=\mathfrak{f}(B_{cl}(B,\Pi,t),\Pi_{cl}(B,\Pi,t))$$

Equation (9) becomes in the presence of the influencer:

$$\mathcal{O}_w(B,\Pi,t) = \mathcal{O}_{cl}(B,\Pi,t) + \Bigg\{ \hbar^2 \int_0^t dt' \Bigg[\frac{1}{4}\Big(\frac{1}{g^2(L)} + \alpha_2 + n_f f_2\Big) \varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^c \frac{\partial^3}{\partial\bar{\Pi}_i^a \partial\bar{\Pi}_i^d \partial\bar{\Pi}_j^e}$$
$$+(\alpha_3+n_f f_3)\bar{B}_i^a \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^b\partial\bar{\Pi}_j^b} + (\alpha_4+n_f f_4)\bar{B}_i^a \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^b\partial\bar{\Pi}_i^b}$$
$$+5(\alpha_5+n_f f_5)\sum_i \bar{B}_i^a\bar{B}_i^a\bar{B}_i^a \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a} + (\alpha_6+n_f f_6)\sum_{i\neq j}\bar{B}_i^a\bar{B}_j^b\bar{B}_j^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a}$$
$$+\frac{1}{2}\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_2^a\bar{B}_3^a\bar{B}_3^a \frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a}$$
$$+\frac{1}{2}\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_2^a\bar{B}_2^a\bar{B}_3^a \frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\Big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\Big)\bar{B}_1^a\bar{B}_3^a\bar{B}_3^a \frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a}$$
$$+2\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_1^a\bar{B}_2^a\bar{B}_3^a\frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a}$$

$$+\frac{1}{2}\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_1^a\bar{B}_2^a\bar{B}_2^a \frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_1^a\bar{B}_1^a\bar{B}_3^a \frac{\partial^3}{\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_1^a\bar{B}_1^a\bar{B}_2^a \frac{\partial^3}{\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\,\bar{B}_k^b\bar{B}_k^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e}$$
$$+2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\bar{B}_j^e\bar{B}_k^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^c\bar{B}_j^e\bar{B}_k^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^d\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^c\bar{B}_i^d\bar{B}_j^e \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^a\bar{B}_i^d\bar{B}_k^b \frac{\partial^3}{\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^a\bar{B}_i^d\bar{B}_j^e \frac{\partial^3}{\partial\bar{\Pi}_j^c\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^e\bar{B}_k^b\bar{B}_k^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d} + (\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^a\bar{B}_i^d\bar{B}_j^b \frac{\partial^3}{\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_j^b}$$
$$+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^e\bar{B}_j^b\bar{B}_j^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d} + 3(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\bar{B}_j^b\bar{B}_j^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e}\Bigg]$$
$$+\hbar^4 \int_0^t dt' \Bigg[-\frac{3}{8}(\alpha_5+n_f f_5)\sum_i \bar{B}_i^a \frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_k^b \frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d\partial\bar{\Pi}_j^e\partial\bar{\Pi}_k^b}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^e \frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$

$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d \frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$
$$-\frac{1}{4}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^b \frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d\partial\bar{\Pi}_j^e\partial\bar{\Pi}_j^b}$$
$$-\frac{1}{8}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d \frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_j^b\partial\bar{\Pi}_j^b}$$
$$-\frac{1}{8}\Big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\Big)\bar{B}_3^a \frac{\partial^5}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a}$$
$$-\frac{1}{8}\big((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\big)\bar{B}_2^a \frac{\partial^5}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}$$
$$-\frac{1}{8}\big((\alpha_7+n_f f_7) + (\alpha_{10} + n_f f_{10})\big)\bar{B}_1^a \frac{\partial^5}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}\Bigg]\Bigg\}\mathcal{O}_{cl}(\bar{B},\bar{\Pi},t') \qquad (10)$$

Where:

$$\mathcal{O}_{cl}(B,\Pi,t) = \mathcal{O}(B_{cl}(B,\Pi,t),\Pi_{cl}(B,\Pi,t))$$
$$\bar{B}_i^e = B_{i\,cl}^e(B,\Pi,t-t')$$
$$\bar{\Pi}_i^e = \Pi_{i\,cl}^e(B,\Pi,t-t')$$

We can now calculate the mean value of the effect:

$$\langle\hat{\mathcal{O}}\rangle = \int dB\, d\Pi\, \mathcal{O}_w(B,\Pi,t)\, \rho_w(B,\Pi) \tag{11}$$

We take the intensity operator at moment 0 of the figure:

$$\hat{\rho}(B,\Pi) = \frac{1}{z} exp[-\beta\hat{H}^0] \tag{12}$$

The simple Wagner form of the density operator Pw can be set in terms of H when we take the harmonic part of the Hamiltonian operator:

$$\hat{H}^0 = \frac{1}{2}\tilde{\alpha}_0\hat{\Pi}_i^a\hat{\Pi}_i^a + \frac{1}{2}\tilde{\alpha}_1\hat{B}_i^a\hat{B}_i^a \tag{13}$$

$$H_w^0 = \frac{1}{2}\tilde{\alpha}_0\Pi_i^a\Pi_i^a + \frac{1}{2}\tilde{\alpha}_1 B_i^a B_i^a \tag{13a}$$

$$\rho_w(B,\Pi) = \frac{1}{z} exp[-\bar{\beta}H_w^0] \tag{14}$$

$$\tilde{\alpha}_0 = \left(\frac{1}{g^2(L)} + \alpha_0 + n_f f_0\right)^{-1}, \tilde{\alpha}_1 = 2(\alpha_1 + n_f f_1)$$
$$\bar{\beta} = \frac{2}{\hbar\sqrt{\tilde{\alpha}_0\tilde{\alpha}_1}} \tanh\left(\frac{\hbar\sqrt{\tilde{\alpha}_0\tilde{\alpha}_1}\beta}{2}\right)$$

We substitute (10) and (15) into (11), and we get:

$$\begin{aligned}\langle\hat{\mathcal{O}}(t)\rangle = \langle\mathcal{O}_{cl,w}(B,\Pi,t)\rangle + \hbar^2 \langle \int_0^t dt' \Bigg[\frac{1}{4}\left(\frac{1}{g^2(L)} + \alpha_2 + n_f f_2\right) \varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^c \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^d\partial\bar{\Pi}_j^e} \\ +(\alpha_3 + n_f f_3)\bar{B}_i^a \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^b\partial\bar{\Pi}_j^b} + (\alpha_4 + n_f f_4)\bar{B}_i^a \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^b\partial\bar{\Pi}_i^b} \\ +5(\alpha_5 + n_f f_5)\sum_i \bar{B}_i^a\bar{B}_i^a\bar{B}_i^a \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a} + (\alpha_6 + n_f f_6)\sum_{i\neq j} \bar{B}_i^a\bar{B}_j^b\bar{B}_j^b \frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a} \\ +\frac{1}{2}((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10}))\bar{B}_2^a\bar{B}_3^a\bar{B}_3^a \frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a}\end{aligned}$$

$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_2^a\bar{B}_2^a\bar{B}_3^a\frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_1^a\bar{B}_3^a\bar{B}_3^a\frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a}$$
$$+2\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_1^a\bar{B}_2^a\bar{B}_3^a\frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_1^a\bar{B}_2^a\bar{B}_2^a\frac{\partial^3}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_1^a\bar{B}_1^a\bar{B}_3^a\frac{\partial^3}{\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a}$$
$$+\frac{1}{2}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_1^a\bar{B}_1^a\bar{B}_2^a\frac{\partial^3}{\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}$$

$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\bar{B}_k^b\bar{B}_k^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e}$$
$$+2(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\bar{B}_j^e\bar{B}_k^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^c\bar{B}_j^e\bar{B}_k^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^d\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^c\bar{B}_i^d\bar{B}_j^e\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^a\bar{B}_i^d\bar{B}_k^b\frac{\partial^3}{\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^a\bar{B}_i^d\bar{B}_j^e\frac{\partial^3}{\partial\bar{\Pi}_j^c\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$
$$+\frac{1}{2}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^e\bar{B}_k^b\bar{B}_k^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d}+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^a\bar{B}_i^d\bar{B}_j^b\frac{\partial^3}{\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_j^b}$$

$$+(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^e\bar{B}_j^b\bar{B}_j^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d}$$
$$+3(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\bar{B}_j^b\bar{B}_j^b\frac{\partial^3}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e}\Bigg]\mathcal{O}_{cl,w}(\bar{B},\bar{\Pi},t')\rangle$$
$$+\hbar^4\langle\int_0^t dt'\Bigg[-\frac{3}{8}(\alpha_5+n_f f_5)\sum_i\bar{B}_i^a\frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a\partial\bar{\Pi}_i^a}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_k^b\frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d\partial\bar{\Pi}_j^e\partial\bar{\Pi}_k^b}$$

$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^e\frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$
$$-\frac{1}{8}(\alpha_8+n_f f_8)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_k^b\partial\bar{\Pi}_k^b}$$
$$-\frac{1}{4}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_j^b\frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_i^d\partial\bar{\Pi}_j^e\partial\bar{\Pi}_j^b}$$
$$-\frac{1}{8}(\alpha_9+n_f f_9)\varepsilon^{fac}\varepsilon^{fde}\bar{B}_i^d\frac{\partial^5}{\partial\bar{\Pi}_i^a\partial\bar{\Pi}_j^c\partial\bar{\Pi}_j^e\partial\bar{\Pi}_j^b\partial\bar{\Pi}_j^b}$$
$$-\frac{1}{8}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_3^a\frac{\partial^5}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a}$$
$$-\frac{1}{8}\left((\alpha_7+n_f f_7)+(\alpha_{10}+n_f f_{10})\right)\bar{B}_2^a\frac{\partial^5}{\partial\bar{\Pi}_1^a\partial\bar{\Pi}_1^a\partial\bar{\Pi}_2^a\partial\bar{\Pi}_3^a\partial\bar{\Pi}_3^a}$$

$$-\frac{1}{8}\left((\alpha_7 + n_f f_7) + (\alpha_{10} + n_f f_{10})\right)\bar{B}_1^a \frac{\partial^5}{\partial \Pi_1^a \partial \Pi_2^a \partial \Pi_2^a \partial \Pi_3^a \partial \Pi_3^a}\Bigg] \mathcal{O}_{cl,w}(\bar{B}, \bar{\Pi}, t')\rangle \qquad (16)$$

The first term of relation (16) represents the classical mean plus all the quantum corrections that come from Pw.
We find from relations 10, 11 and 15:
Thus we get the quantum solution.

Results

Equation 16 can be solved numerically by putting a program in the language of Fortan according to the Monte Carlo method.
The time evolution of the average value of colored and electric magnetic energy. These values will differ from the reference [17] because the Hamiltonian effect contains limits of a higher order. The values can be compared with the experimental results with the technical development with an interval greater than 10. 23 to record the colored magnetic and electric energy spectrum.
When the amount g2 is small, its reciprocal becomes large, so the perturbation theory cannot be applied to study the temporal evolution of colored magnetic and electric energy.
The method, according to Monte Carlo, enables us to calculate numerically the real-time evolution of the average value of each of the colored magnetic and electric energies. After obtaining the numerical values of the average value, the graphs of this value can be drawn in terms of time and investigated for its behavior according to temperature and the correlation constant g.

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