Anisotropic Magnetized Asteroseismic Waves

This notebook contains lengthy algebraic manipulations using Mathematica to obtain an analytical formula for the magnetically-modified eigenfrequencies of waves in a polytropic atmosphere.

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Below are the matrix elements presented in Appendix A of the paper.

$$\begin{split} & \text{In}[1] := \ M11 \ = \ -\Omega^2 \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right); \\ & \text{M12} \ = \ 0; \\ & \text{M13} \ = \frac{-\text{I} \, K_X \, (n+1) \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)}{\gamma}; \\ & \text{M21} \ = \ \varepsilon^2 \, K_X \, K_Y \, Z; \\ & \text{M22} \ = \ -\Omega^2 \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right) + \varepsilon^2 \, K_X^2 \, Z; \\ & \text{M23} \ = \frac{-\text{I} \, K_Y \, (n+1) \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)}{\gamma}; \\ & \text{M31} \ = \ \frac{\text{I} \, K_X}{\gamma} \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{\varepsilon^2 \, K_X^2 \, Z \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)}{\Omega^2 \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)} \right); \\ & \text{M32} \ = \ \frac{\text{I} \, K_Y}{\gamma} \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{\varepsilon^2 \, K_X^2 \, Z \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)}{\Omega^2 \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)} \right); \\ & \text{M33} \ = \ \frac{-\Omega^2 \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right) + \varepsilon^2 \, K_X^2 \, Z}{n+1}; \\ & \text{h}_X \ = \ \text{I} \, K_X \, Z \, \chi; \\ & \text{h}_Y \ = \ \text{I} \, K_Y \, Z \, \chi \, \left(1 + \, \varepsilon^2 \right); \\ & \text{h0} \ = \ \left(1 + \varepsilon^2 \, \left(1 + \frac{K_X^2 \, Z \, \left(\gamma - (n+1) \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right) \right)}{(n+1) \, \gamma \, \Omega^2 \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)} \right) \right); \\ & \text{h1} \ = \ \frac{Z}{n+1} \, \left(1 + \varepsilon^2 \, \left(1 + \frac{K_X^2 \, Z \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)}{\Omega^2 \, \left(1 + \gamma \, \varepsilon^2 \, / \, 2 \right)} \right); \\ & \text{h}_Z \ = \ \chi \star \text{h0} + D \left[\chi \left[Z \right], \, Z \right] \star \text{h1}; \\ & \text{Minv} \ = \ \text{Inverse} \left[\left(\left\{ \left\{ \text{M11}, \, \text{M12}, \, \text{M13} \right\}, \, \left\{ \text{M21}, \, \text{M22}, \, \text{M23} \right\}, \, \left\{ \text{M31}, \, \text{M32}, \, \text{M33} \right\} \right\} \right) \right]; \end{aligned}$$

Equation (22) of the paper is changed to Eq. (23) below using matrix

inversion technique.

```
In[16]:= ufullhaschi = Dot[Minv, \left\{\frac{h_{\chi}}{\chi}, \frac{h_{\gamma}}{\chi}, h0\right\}];
      uxchi = ufullhaschi[1];
      uychi = ufullhaschi[2];
      uzchi = ufullhaschi[3];
      ufullhasderivativeofchi = Dot[Minv, {0, 0, h1}];
      uxdervchi = ufullhasderivativeofchi [[1]];
      uydervchi = ufullhasderivativeofchi [[2]];
      uzdervchi = ufullhasderivativeofchi [[3]];
      ux = uxchi * \chi + uxdervchi * D[\chi[Z], Z];
      uy = uychi * \chi + uydervchi * D[\chi[Z], Z];
      uz = uzchi * \chi + uzdervchi * D[\chi[Z], Z];
```

Equation (24) of the paper is obtained next.

```
In[27]:= (*-----
     (*i kx ux + i ky uy + dz(uz) = \chi;
     i kx ux + i ky uy + dz(uz) - \chi = 0;
     SchrodingerformSECONDDERIVATIVEchi D^2\chi +
       SchrodingerformFIRSTDERIVATIVEchi D\chi +
       SchrodingerformZERODERIVATIVEchi_original \chi - \chi = 0;
     SchrodingerformSECONDDERIVATIVEchi D^2\chi +
       SchrodingerformFIRSTDERIVATIVEchi D\chi +
       (SchrodingerformZERODERIVATIVEchi_original - 1) \chi = 0;
     SchrodingerformSECONDDERIVATIVEchi D^2\chi +
       SchrodingerformFIRSTDERIVATIVEchi D\chi +
        (SchrodingerformZERODERIVATIVEchi) \chi = 0*)
     SchrodingerformZERODERIVATIVEchi = I * K_X * uxchi + I * K_Y * uychi + D[uzchi, Z] - 1;
     SchrodingerformFIRSTDERIVATIVEchi =
       I * K<sub>X</sub> * uxdervchi + I * K<sub>Y</sub> * uydervchi + (uzchi + D[uzdervchi, Z]);
     SchrodingerformSECONDDERIVATIVEchi = 0 + 0 + uzdervchi;
```

Equation (24) of the paper is recast in the form of Eq. (26) below.

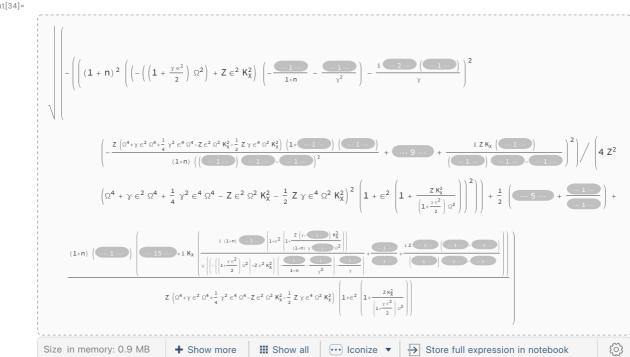
```
(* D^2\chi + f(Z) * D\chi + r(Z) * \chi = 0, Following the arxiv paper v2,
 https://arxiv.org/pdf/1812.06947v2.pdf *)
f[Z_] := SchrodingerformFIRSTDERIVATIVEchi
SchrodingerformSECONDDERIVATIVEchi
r[Z_] := SchrodingerformZERODERIVATIVEchi
SchrodingerformSECONDDERIVATIVEchi;
 (*Tolstoy equation/Normal-form here*)
 \left(\star \frac{d^2 \psi}{dZ^2} + Q(Z, \epsilon) \psi = 0\star\right)
 \left(\star \frac{d^2 \psi}{d^2} + \Gamma^2(Z, \epsilon) \psi = 0\star\right)
Q[Z_{-}] := r[Z] - \frac{(f[Z])^{2}}{4} - \frac{D[f[Z], Z]}{2};
Gammafreq [Z_] := \sqrt{Q[Z]}
```

Next shown is the expression of Γ (Z, ϵ) that appears in Eq. (26) of the paper .

In[34]:=

Gammafreq [Z]

Out[34]=



Following Eq. (28) of the paper, Γ (Z, ϵ) is expanded in powers of ϵ .

In[35]:=

Gammaexpanded = Normal[Series[Gammafreq[Z], $\{\epsilon, 0, 2\}$]]

Out[35]=

$$\frac{1}{2} \sqrt{\left(\frac{1}{z^2 \gamma^2 \, \alpha^2}\right)^2} \\ - \left(-2 \, n \, \gamma^2 \, \Omega^2 - n^2 \, \gamma^2 \, \Omega^2 + 4 \, Z \, \gamma^2 \, \Omega^4 - 4 \, Z \, K_x^2 - 8 \, n \, Z \, K_x^2 - 4 \, n^2 \, Z \, K_x^2 + 4 \, n \, Z \, \gamma \, K_x^2 + 4 \, n^2 \, Z \, \gamma \, K_x^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_x^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_x^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_x^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_y^2 \right) + \\ - \left(Z \, e^2 \, \sqrt{\left(\frac{1}{z^2 \, \gamma^2 \, \Omega^2} \left(-2 \, n \, \gamma^2 \, \Omega^2 - n^2 \, \gamma^2 \, \Omega^2 + 4 \, Z \, \gamma^2 \, \Omega^4 - 4 \, Z \, K_x^2 - 8 \, n \, Z \, K_x^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_y^2 \right) \right) + \\ - \left(Z \, e^2 \, \sqrt{\left(\frac{1}{z^2 \, \gamma^2 \, \Omega^2} \left(-2 \, n \, \gamma^2 \, \Omega^2 - n^2 \, \gamma^2 \, \Omega^2 + 4 \, Z \, \gamma^2 \, \Omega^4 - 4 \, Z \, K_x^2 - 4 \, Z \, X_x^2 - 8 \, n \, Z \, K_x^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_x^2 - 2 \, Z^2 \, Z^2 \, K_x^2 - 2 \, Z^2 \, K_x^2 - 2 \, Z^2$$

In[36]:= numeratorofintendedterm =

$$\left(-2\, \gamma^4\, \Omega^{10} + \gamma^5\, \Omega^{10} + 4\, \gamma^2\, \Omega^6\, K_X^2 + 8\, n\, \gamma^2\, \Omega^6\, K_X^2 + 4\, n^2\, \gamma^2\, \Omega^6\, K_X^2 - 4\, \gamma^3\, \Omega^6\, K_X^2 - 8\, n\, \gamma^3\, \Omega^6\, K_X^2 - 4\, n^2\, \gamma^3\, \Omega^6\, K_X^2 + 3\, n\, \gamma^4\, \Omega^6\, K_X^2 + 2\, n^2\, \gamma^4\, \Omega^6\, K_X^2 - 2\, Z\, \gamma^4\, \Omega^8\, K_X^2 - 2\, \Omega^2\, K_X^4 - 8\, n\, \Omega^2\, K_X^4 - 12\, n^2\, \Omega^2\, K_X^4 - 8\, n\, \Omega^2\, K_X^4 - 12\, n^2\, \Omega^2\, K_X^4 - 8\, n\, \Omega^2\, K_X^4 + 12\, n^3\, \gamma\, \Omega^2\, K_X^4 - 12\, n^2\, \Omega^2\, K_X^4 - 12\, n^2\, \Omega^2\, K_X^4 - 12\, n^3\, \gamma\, \Omega^2\, K_X^4 + 12\, n^3\, \gamma\, \Omega^2\, K_X^4 + 12\, n^3\, \gamma\, \Omega^2\, K_X^4 - 12\, n^2\, \chi^2\, K_X^4 - 12\, n^2\, \chi^2\, K_X^4 - 12\, n^3\, \chi^2\, \Omega^2\, K_X^4\, K_Y^2 - 12\, n^3\, \chi^2\, \Omega^2\, K_X^2\, K_Y^2 - 12\, n^3\, \chi^2\, \Omega^2\, K_X^2\, K_Y^2 - 12\, n^3\, \chi^2\, K_X^2\, K_Y^2 -$$

In[37]:= FullSimplify[Coefficient[numeratorofintendedterm , Z, 2]]

Out[37]=

$$-\,4\,\,\gamma^{2}\,\,\Omega^{2}\,\,K_{X}^{4}\,\,\left(\,-\,\gamma^{2}\,\,\Omega^{4}\,+\,\,\left(\,1\,+\,n\,\right)^{\,2}\,\,K_{X}^{2}\,+\,\,\left(\,1\,+\,n\,\right)^{\,2}\,\,K_{Y}^{2}\,\right)$$

In[38]:= FullSimplify[Coefficient[numeratorofintendedterm /

$$\left(2\,\Omega^{2}\,*\left(\gamma^{2}\,\Omega^{4}-K_{X}^{2}-2\,n\,K_{X}^{2}-n^{2}\,K_{X}^{2}-K_{Y}^{2}-2\,n\,K_{Y}^{2}-n^{2}\,K_{Y}^{2}\right)\,*\,\left(\gamma\,\Omega\,*2\,I\,\gamma\,\Omega\,K\right)\right)\;,\;Z,\;2\right]\right]$$

Out[38]=

$$-\frac{i K_X^4}{K \Omega^2}$$

The following expression is b_2 that appears in $\Gamma_2 = \frac{b_2 Z^2 + b_1 Z + b_0}{\sqrt{(Z - \alpha) (Z - \beta)}}$.

In[39]:= FullSimplify[Coefficient[numeratorofintendedterm /

$$\left(2 \Omega^2 * \left(\gamma^2 \Omega^4 - K_X^2 - 2 n K_X^2 - n^2 K_X^2 - K_Y^2 - 2 n K_Y^2 - n^2 K_Y^2 \right) * \left(\gamma \Omega * 2 I \gamma \Omega K \right) \right) ,$$

$$Z, 2] /. K_X \rightarrow K Cos[\theta] /. K_Y \rightarrow K Sin[\theta]]$$

Out[39]=

$$-\frac{i K^3 Cos[\theta]^4}{\Omega^2}$$

■ The following expression is
$$b_1$$
 that appears in $\Gamma_2 = \frac{b_2 Z^2 + b_1 Z + b_0}{\sqrt{(Z - \alpha)(Z - \beta)}}$

$$\begin{split} & \text{In[40]:= FullSimplify} \big[\text{Coefficient} \big[\text{numeratorofintendedterm } \Big/ \\ & \qquad \qquad \left(2 \, \Omega^2 \, * \left(\gamma^2 \, \Omega^4 - K_X^2 - 2 \, n \, K_X^2 - n^2 \, K_Y^2 - 2 \, n \, K_Y^2 - n^2 \, K_Y^2 \right) * \left(\gamma \, \Omega \, * \, 2 \, I \, \gamma \, \Omega \, K \right) \right) \, , \\ & \qquad \qquad Z \, , \, 1 \big] \, / \, . \, \, K_X \to K \, \text{Cos} \, [\theta] \, / \, . \, \, K_Y \to K \, \text{Sin} \, [\theta] \, \Big] \\ & \qquad \qquad \left(\text{i} \, \, K \, \text{Cos} \, [\theta]^2 \, \left(2 \, K^4 \, \left(1 + n \right)^4 - K^2 \, \left(1 + n \right) \, \gamma^2 \, \left(1 + n + 3 \, \gamma \right) \, \Omega^4 - \gamma^4 \, \Omega^8 + \right. \\ & \qquad \qquad \left. \quad \quad \left(K^2 \, \left(1 + n \right)^2 \, \left(-1 + n \, \left(-1 + \gamma \right) \right) + \gamma^2 \, \left(1 + n + \gamma - n \, \gamma \right) \, \Omega^4 \right) \, \text{Cos} \, [2 \, \theta] \, \right) \, / \, \\ & \qquad \left(2 \, \gamma^2 \, \Omega^4 \, \left(K^2 \, \left(1 + n \right)^2 - \gamma^2 \, \Omega^4 \right) \right) \end{split}$$

$$\begin{split} &\text{In[41]:= FullSimplify} \big[\text{Coefficient} \big[\text{numeratorofintendedterm /} \\ & \quad \left(2~\Omega^2~* \left(\gamma^2~\Omega^4 - K_X^2 - 2~n~K_X^2 - K_Y^2 - 2~n~K_Y^2 - n^2~K_Y^2 \right) * \left(\gamma~\Omega~*~2~I~\gamma~\Omega~K \right) \right)~, \\ & \quad Z~,~0 \big]~/.~K_X \rightarrow K~Cos[\theta]~/.~K_Y \rightarrow K~Sin[\theta]~\big] \end{split}$$

$$\begin{split} &-\frac{1}{16\;\text{K}^3\;\left(1+n\right)^2\;\gamma^2\;\Omega^2-16\;\text{K}\;\gamma^4\;\Omega^6}\,\dot{\mathbb{I}}\;\left(\text{K}^4\;\left(1+n\right)^2\;\left(8\;\left(1+n\right)^2-8\;\left(1+n\right)^2\;\gamma+n\;\left(1+4\;n\right)\;\gamma^2\right)-\\ &-2\;\text{K}^2\;\gamma^2\;\left(8\;\left(1+n\right)^2-6\;\left(1+n\right)^2\;\gamma+n\;\left(3+2\;n\right)\;\gamma^2\right)\;\Omega^4-4\;\left(-2+\gamma\right)\;\gamma^4\;\Omega^8+\\ &-2\;\text{K}^2\;\gamma\;\left(\text{K}^2\;\left(1+n\right)^2\;\left(-2+n\;\left(-4+2\;n\;\left(-1+\gamma\right)+\gamma\right)\right)+\gamma^2\;\left(2\;\left(1+n\right)^2-n\;\left(3+2\;n\right)\;\gamma\right)\;\Omega^4\right)\\ &-\text{Cos}\left[2\;\theta\right]+\text{K}^4\;n\;\left(1+n\right)^2\;\gamma^2\;\text{Cos}\left[4\;\theta\right]\right) \end{split}$$

The next cell displays an expression of the form $(Z - \alpha)$ $(Z - \beta) = Z^2 - (\alpha + \beta) Z + \alpha \beta = 0$.

$$\begin{split} & \text{In}[42] \coloneqq \text{ lamb2TPpolynomial } = \text{ Simplify} \Big[\\ & \quad \left(\left(-2 \, n \, \gamma^2 \, \Omega^2 - n^2 \, \gamma^2 \, \Omega^2 + 4 \, Z \, \gamma^2 \, \Omega^4 - 4 \, Z \, K_X^2 - 8 \, n \, Z \, K_X^2 - 4 \, n^2 \, Z \, K_X^2 + 4 \, n \, Z \, \gamma \, K_X^2 + 4 \, n^2 \, Z \, \gamma \, K_X^2 - 4 \, Z^2 \, \gamma^2 \, \Omega^2 \, K_X^2 - 4 \, Z \, X_Y^2 - 4 \, Z^2 \, X_Y^2 - 4 \, Z^2 \, X_Y^2 \, \right) \Big/ \\ & \quad \left(-4 \, \gamma^2 \, \Omega^2 \, K_X^2 \right) \Big) \, / \cdot \, K_X \to K \, \text{Cos}[\theta] \, / \cdot \, K_Y \to K \, \text{Sin}[\theta] \, \Big]$$

 $\frac{2\;n+n^2-4\;Z\;\Omega^2}{4\;K^2}\;+\;\frac{Z\;\left(1-n\;\left(-2+\gamma\right)\;-n^2\;\left(-1+\gamma\right)\;+\;Z\;\gamma^2\;\Omega^2\right)}{\gamma^2\;\Omega^2}$

In[43]:= FullSimplify[Coefficient[lamb2TPpolynomial, Z, 2]] (*This is 1.*) Out[43]=

In[44]:= FullSimplify[Coefficient[lamb2TPpolynomial, Z, 1]] (*This is $-(\alpha+\beta)$. *) Out[44]=

 $-\frac{(1+n)~(1+n-n~\gamma)}{\gamma^2~\Omega^2}~-\frac{\Omega^2}{K^2}$

ln[45]:= FullSimplify[Coefficient[lamb2TPpolynomial, Z, 0]] (*This is α β . *)

Out[45]= $\frac{n (2 + n)}{4 \kappa^2}$

1

(*The full expression of $\Gamma(Z, \epsilon)$ is given below. Disclaimer: The expression presented below is of exhaustive length.*)

In[46]:= Gammafreq [Z]

$$\begin{split} &\inf[46]=\\ &\inf[46]=\\ &\sqrt{\left(-\left(\left(1+n\right)^2\left(\left(-\left(\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\,\Omega^2\right)+Z\,\varepsilon^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\,\Omega^2\right)+Z\,\varepsilon^2\,K_X^2\right)}{1+n}\right)-\\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\,K_X^2\left(1+\frac{3\,\gamma\,\varepsilon^2}{2}+\frac{Z\,\varepsilon^2\,K_X^2}{\Omega^2}\right)}{\gamma^2}\right)-\\ &\frac{i\,\left(1+\frac{\gamma\,\varepsilon^2}{2}+\frac{Z\,\varepsilon^2\,K_X^2}{\Omega^2}\right)\,K_Y\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)^2\,\Omega^2\,K_Y}{\gamma}+\frac{i\,\left(1+n\right)\,Z\,\varepsilon^2\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right)^2}{\gamma}\\ &\left(-\left(\left[Z\,\left(\Omega^4+\gamma\,\varepsilon^2\,\Omega^4+\frac{1}{4}\,\gamma^2\,\varepsilon^4\,\Omega^4-Z\,\varepsilon^2\,\Omega^2\,K_X^2-\frac{1}{2}\,Z\,\gamma\,\varepsilon^4\,\Omega^2\,K_X^2\right)\right] \end{split}$$

$$\begin{split} \left(1+\varepsilon^2\left(1+\frac{Z\;K_X^2}{\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;\Omega^2}\right)\right) &\left(\left(-\left(\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;\Omega^2\right)+Z\,\varepsilon^2\;K_X^2\right)\right) \\ &\left(-\frac{\varepsilon^2\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;\Omega^2\;K_X^2}{1+n}-\frac{(1+n)\;\varepsilon^2\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;K_X^4}{\gamma^2\;\Omega^2}\right)+\\ &\varepsilon^2\;K_X^2\left(-\frac{\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;\Omega^2\left(-\left(\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;\Omega^2\right)+Z\,\varepsilon^2\;K_X^2\right)}{1+n}-\\ &\frac{(1+n)\;\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;K_X^2\left(1+\frac{3\,\gamma\,\varepsilon^2}{2}+\frac{Z\,\varepsilon^2\,K_X^2}{\Omega^2}\right)}{\gamma^2}\right)+\\ &\frac{(1+n)\;\varepsilon^2\left(1+\frac{\gamma\,\varepsilon^2}{2}\right)\;K_X^2\left(1+\frac{\gamma\,\varepsilon^2}{2}+\frac{Z\,\varepsilon^2\,K_X^2}{\Omega^2}\right)\;K_Y^2}{\gamma^2}-\\ \end{split}$$

$$\begin{split} &\frac{\mathrm{i} \ e^{2} \ K_{X}^{2} \ K_{Y}}{Y} \left(\frac{\mathrm{i} \ (1-n) \ \left(1+\frac{\gamma e^{2}}{Y}\right) \ \alpha^{2} \ K_{Y}}{Y} + \frac{\mathrm{i} \ (1+n) \ ze^{2} \left(1+\frac{\gamma e^{2}}{Y}\right) \ K_{X}^{2}}{Y} \right)}{\gamma} \right) \right) / \left((1+\frac{\gamma e^{2}}{2}) \ \Omega^{2} \right) + Z \ e^{2} \ K_{X}^{2} \right) \\ &- \left(-\frac{\left(1+\frac{\gamma e^{2}}{2}\right) \ \Omega^{2} \left(-\left(\left(1+\frac{\gamma e^{2}}{2}\right) \ \Omega^{2}\right) + Z \ e^{2} \ K_{X}^{2}}{1+n} - \frac{(1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ K_{X}^{2} \left(1+\frac{3\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right)}{\gamma^{2}} \right) - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right)^{2} \ \Omega^{2} \ K_{Y}}{\gamma} + \frac{\mathrm{i} \ (1+n) \ Z \ e^{2} \ \left(1+\frac{\gamma e^{2}}{\gamma}\right) \ K_{X}^{2} \ K_{Y}}{\gamma} \right) \right)^{2} \right) \right)}{\gamma} \\ &\left(Z \ e^{2} \ K_{X}^{2} \left(\Omega^{4} + \gamma \ e^{2} \ \Omega^{4} + \frac{1}{4} \ \gamma^{2} \ e^{4} \ \Omega^{4} - Z \ e^{2} \ \Omega^{2} \ K_{X}^{2} - \frac{1}{2} \ Z \ \gamma \ e^{4} \ \Omega^{2} \ K_{X}^{2} \right) \right) / \\ &\left((1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ \Omega^{2} \left(-\left(\left(1+\frac{\gamma e^{2}}{2}\right) \ \Omega^{2}\right) + Z \ e^{2} \ K_{X}^{2} \right) \\ &- \frac{\left(1+n\right) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ \Omega^{2} \left(-\left(\left(1+\frac{\gamma e^{2}}{2}\right) \ \Omega^{2}\right) + Z \ e^{2} \ K_{X}^{2} \right)}{\gamma} - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2}\right) \ K_{X}^{2} \ C^{2} \ K_{X}^{2}}{\gamma} \right) \ \right) - \frac{\mathrm{i} \ \left(1+\frac{\gamma e^{2}}{2} + \frac{2e^{2} \ K_{X}^{2}}{\alpha^{2}}\right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right) \ K_{Y} \left(\frac{\mathrm{i} \ (1+n) \ \left(1+\frac{\gamma e^{2}}{2}\right) \ C^{2} \ K_{X}^{2}}{\gamma} \right)$$

$$\begin{split} \left| \gamma \left[\left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right. \\ \\ \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{2} \right)}{\gamma^2} \right) - \\ \\ \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, e^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{\gamma} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right] \right) + \\ \left[Z \, \left(- e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \, \left[1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2} \right) \right] \right) \right] / \left[\left(1 + n \right) \right. \\ \left. \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \, \left[- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right. \right. \\ \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^3 \, K_X^2}{\sigma^2} \right)}{1 + n} \right. \right. \\ \left. - \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right)}{\gamma} \right. \right) \right] \right) \right. \\ \left. - \left(\left(\Omega^4 + \gamma \, e^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, e^4 \, \Omega^4 - Z \, e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right) \right. \right) \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right) \right. \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right) \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ \left. \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ \left. \left. \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right. \right. \\ \left. \left. \left(1 + \frac{Z \, K_X^$$

$$\frac{(1+n) \left(1+\frac{\gamma e^2}{2}\right) K_X^2 \left(1+\frac{3\gamma e^2}{2}+\frac{2 e^2 K_X^2}{\sigma^2}\right)}{\gamma^2} \right) - \\ \frac{i \left(1+\frac{\gamma e^2}{2}+\frac{2 e^2 K_X^2}{\sigma^2}\right) K_Y \left(\frac{i \cdot (1+n) \left(1+\frac{\gamma e^2}{2}\right)^2 \sigma^2 K_Y}{\gamma}+\frac{i \cdot (1+n) \cdot 2 e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma}\right)}{\gamma} \right) \right) + \\ \left(\left(\Omega^4+\gamma \varepsilon^2 \Omega^4+\frac{1}{4} \gamma^2 e^4 \Omega^4 - Z \varepsilon^2 \Omega^2 K_X^2 - \frac{1}{2} \cdot Z \gamma \varepsilon^4 \Omega^2 K_X^2 \right) \\ \left(1+\varepsilon^2 \left(1+\frac{Z \left(\gamma - (1+n) \left(1+\frac{\gamma e^2}{2}\right)\right) K_X^2}{(1+n) \cdot \gamma \left(1+\frac{\gamma e^2}{2}\right) \Omega^2}\right) \right) \right) \right) / \\ \left(\left[-\left(\left(1+\frac{\gamma e^2}{2}\right) \Omega^2\right) + Z \varepsilon^2 K_X^2 \right) \left(-\frac{\left(1+\frac{\gamma e^2}{2}\right) \Omega^2 \left(-\left(\left(1+\frac{\gamma e^2}{2}\right) \Omega^2\right) + Z \varepsilon^2 K_X^2 \right)}{1+n} - \frac{i \cdot \left(1+\frac{\gamma e^2}{2}\right) K_X^2 \left(1+\frac{3\gamma e^2}{2}+\frac{2 e^2 K_X^2}{\sigma^2}\right)}{\gamma} \right) - \frac{i \cdot \left(1+\frac{\gamma e^2}{2}\right) \Omega^2 \Omega^2 \left(1+\frac{\gamma e^2}{2}\right) \Omega^2 \Omega^2 \left(1+\frac{\gamma e^2}{2}\right)$$

$$\begin{split} \left[i \ Z \left(1 + \varepsilon^2 \left(1 + \frac{Z \ K_X^2}{\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2} \right) \right] K_Y \left[- \frac{i \ (1 + n) \ \left(1 + \frac{Y \varepsilon^2}{2} \right)^2 \Omega^2 \ K_Y}{Y} - \frac{i \ (1 + n) \ Z \ e^2 \left(1 + \frac{Y \varepsilon^2}{2} \right) K_X^2 \ K_Y}{Y} \right] \right] / \left[(1 + n) \right] \\ & \left[\left(- \left(\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \right) + Z \ e^2 \ K_X^2 \right) \left(- \frac{\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \left(- \left(\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \right) + Z \ e^2 \ K_X^2 \right)}{1 + n} \right) - \frac{(1 + n) \ \left(1 + \frac{Y \varepsilon^2}{2} \right) K_X^2 \left(1 + \frac{3 \gamma \varepsilon^2}{2} + \frac{Z \varepsilon^2 K_X^2}{\Omega^2} \right)}{Y^2} \right) - \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} + \frac{Z \varepsilon^2 K_X^2}{\Omega^2} \right) K_Y \left(\frac{i \ (1 + n) \ \left(1 + \frac{Y \varepsilon^2}{2} \right)^2 \Omega^2 K_Y}{Y} + \frac{1 \ (1 + n) \ Z \varepsilon^2 \left(1 + \frac{Y \varepsilon^2}{2} \right) K_X^2 K_Y}{Y} \right) \right] \right)}{Y} \\ & \left[i \ Z \ K_X \left(\frac{i \ \Omega^2 \ K_X}{Y} + 2 \ i \ e^2 \ \Omega^2 \ K_X + \frac{3}{4} \ i \ Y \ e^4 \ \Omega^2 \ K_X - i \ Z \ e^4 \ K_X^2 - \frac{i \ Z^2 \ e^4 \ K_X^2}{Y} + \frac{i \ (1 + n) \ Z \varepsilon^2 \left(1 + \frac{Y \varepsilon^2}{2} \right) K_X^2 K_Y}{Y \Omega^2} \right) \right] \right] \\ & \left[\left(- \left(\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \right) + Z \ e^2 \ K_X^2 \right) \left(- \frac{\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \left(- \left(\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \right) + Z \ e^2 \ K_X^2 \right)}{1 + n} - \frac{i \ \left(1 + n \right) \left(1 + \frac{Y \varepsilon^2}{2} \right) K_X^2 \left(1 + \frac{3 \gamma \varepsilon^2}{2} + \frac{Z \varepsilon^2 K_X^2}{\Omega^2} \right)}{Y} \right) - \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} + \frac{Z \varepsilon^2 K_X^2}{2} \right) K_Y \left(\frac{i \ (1 + n) \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \left(- \left(\left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \right) + Z \ e^2 \ K_X^2 \right)}{Y} \right] \right) \right]}{Y} \right] \\ & \left[4 \ Z^2 \left(\Omega^4 + Y \ e^2 \ \Omega^4 + \frac{1}{4} \ Y^2 \ e^4 \ \Omega^4 - Z \ e^2 \ \Omega^2 \ K_X^2 - \frac{1}{2} \ Z \ Y \ e^4 \ \Omega^2 \ K_X^2 \right)^2 \right] \\ & \left[- \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} + \frac{Z \varepsilon^2 K_X^2}{2} \right)}{2} \left(- \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \left(- \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \left(- \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2}{Y} \right) + Z \ e^2 \ K_X^2 \right)}{1 + n} \right) \right] \right] \right] \right] \\ - \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} + \frac{Z \varepsilon^2 K_X^2}{2} \right) K_Y \left(\frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2 \left(- \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2}{Y} \right) \Omega^2 \left(- \frac{i \ \left(1 + \frac{Y \varepsilon^2}{2} \right) \Omega^2}{Y} \right) \right] \right] \right]$$

$$\begin{split} \left[1 + \varepsilon^2 \left[1 + \frac{z \, K_X^2}{\left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2}\right]\right]^2\right] + \\ \frac{1}{2} \left[-\left[\left[\left(1 + n\right) \left[\left(-\left(\left[1 + \frac{y \, \varepsilon^2}{2}\right] \, \Omega^2\right] + Z \, \varepsilon^2 \, K_X^2\right] \left[-\frac{\left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2 \left(-\left(\left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2\right) + Z \, \varepsilon^2 \, K_X^2\right)}{1 + n}\right] - \\ \frac{\left[\left(1 + n\right) \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, K_X^2 \left(1 + \frac{3 \, y \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2}\right)\right]}{y^2}\right] - \\ \frac{i \left(1 + \frac{y \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2}\right) \, K_Y \left(\frac{1 \, \left(1 + n\right) \left[1 + \frac{y \, \varepsilon^2}{2}\right] \, \Omega^2 \, K_Y}{y} + \frac{1 \, \left(1 + n\right) \, Z \, \varepsilon^2 \, \left(1 + \frac{y^2}{2}\right) \, K_X^2 \, K_Y}{y}\right)}{y}\right) \\ \left[\left[2 \, Z \left(\Omega^4 + \gamma \, \varepsilon^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, \varepsilon^4 \, \Omega^4 - Z \, \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2\right) \\ \left[1 + \varepsilon^2 \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2}\right)\right] \left[\left[-\left(\left[1 + \frac{\gamma \, \varepsilon^2}{2}\right] \, \Omega^2 \, K_X^2\right] \\ \left[-\frac{\varepsilon^2 \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{\left(1 + n\right) \, \varepsilon^2 \, \left(1 + n\right) \, \varepsilon^2 \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, K_X^2}{y^2 \, \Omega^2}\right] + \\ \varepsilon^2 \, K_X^2 \left(-\frac{\left(1 + n\right) \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2 \, \left(1 + n\right) \, \varepsilon^2 \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, K_X^2}{y^2}\right) + \\ \frac{\left(1 + n\right) \, \varepsilon^2 \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, y \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{2}\right)}{y^2}\right] \\ \frac{i \, \varepsilon^2 \, K_X^2 \, K_Y \left(\frac{1 \, \left(1 + n\right) \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, \Omega^2 \, K_Y}{y} + \frac{1 \, \left(1 + n\right) \, Z \, \varepsilon^2 \, \left(1 + \frac{y \, \varepsilon^2}{2}\right) \, K_X^2}{y}}{y}\right]^2\right] / \left(1 + n\right)} \right] \right) \right]$$

$$\begin{split} &\left[\left(-\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\left(-\frac{\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{1+n}\right. \\ &\left. -\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{2}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right)-\frac{i\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\,K_{Y}\,\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)^{2}\,\sigma^{2}\,K_{Y}}{\gamma}+\frac{i\,\left(1+n\right)\,Z\,\varepsilon^{3}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,K_{Y}}{\gamma}\right)}{\gamma}\right)^{3}\right]}{\gamma} \\ &\left[Z\,\left(\Omega^{4}+\gamma\,\varepsilon^{2}\,\Omega^{4}+\frac{1}{4}\,\gamma^{2}\,\varepsilon^{4}\,\Omega^{4}-Z\,\varepsilon^{2}\,\Omega^{2}\,K_{X}^{2}-\frac{1}{2}\,Z\,\gamma\,\varepsilon^{4}\,\Omega^{2}\,K_{X}^{2}}{\gamma}\right) \\ &\left[1+\varepsilon^{2}\left(1+\frac{Z\,K_{X}^{2}}{\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}}\right)\right]\left(2\,\varepsilon^{2}\,K_{X}^{2}\left(-\frac{\varepsilon^{2}\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\,K_{X}^{2}}{1+n}\right.\right. \\ &\left.\left.\left.\left(1+n\right)\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\right)\right]+\frac{2\,\left(1+n\right)\,\varepsilon^{4}\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\,K_{X}^{2}\,K_{Y}^{2}}{\gamma^{2}\,\sigma^{2}}\right)\right]\right/\left[\left(1+n\right) \\ &\left.\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\left(-\frac{\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{\gamma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right)-\frac{i\,\left(1+n\right)\,Z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,K_{Y}^{2}}}{\gamma^{2}}\right)}{\gamma^{2}}\right]^{2}\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,K_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}}\right)\right] \\ &\left.\left(1+n\right)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^{2}\,K_{X}^$$

$$\begin{split} & \left[\left(- \left(\left[1 + \frac{\gamma \, \varepsilon^2}{2} \right] \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \\ & \left(- \frac{e^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} \, - \frac{(1 + n) \, \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^4}{\gamma^2 \, \Omega^2} \right) + \\ & e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{1 + n} \right. \\ & \left. - \frac{(1 + n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \right) + \\ & \left. - \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \, K_Y^2}{\gamma^2} \right. \\ & \left. - \frac{i \, e^2 \, K_X^2 \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right] \right)}{\gamma \, \Omega^2} \\ & \left(\left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \right. \\ & \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{\gamma^2} \right. \right. \\ & \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{\gamma^2} \right. \right. \\ & \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{\gamma^2} \right) \right. \\ & \left. - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X}{\gamma^2} \right) \, K_Y \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) }{\gamma^2} \right) \right. \\ & \left. - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X} \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right)}{\gamma^2} \right) - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X}{\gamma^2} \right) \, K_Y \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \right. \\ & \left. - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X}{\gamma^2} \right) \, K_Y \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \right. \\ \left. - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \, K_Y \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \right) \right. \\ \left. - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\alpha^2} \right) \, K_Y \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2}$$

$$\begin{split} & \left[\left(- \left(\left[1 + \frac{\gamma \, e^2}{2} \right] \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \\ & \left(- \frac{e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^4}{\gamma^2 \, \Omega^2} \right) + \\ & e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2}{1 + n} - \frac{(1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\alpha^2} \right) \right)}{\gamma^2} \right) + \\ & \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\alpha^2} \right) \, K_Y^2}{\gamma^2} - \frac{1}{\gamma^2} \\ & \frac{i \, e^2 \, K_X^2 \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, 2^2 \, e^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, 2 \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, R_X^2 \, K_Y}{\gamma} \right)}{\gamma \, \Omega^2} \right) \right] / \\ & \sqrt{\gamma} \, \Omega^2 \\ \\ & \left[\gamma \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2}{\gamma} \right)}{1 + n} - \frac{i \, \left(1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\alpha^2} \right)}{\gamma} \right)}{\gamma^2} \right] - \\ & \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\alpha^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_Y^2 \, K_Y}{\gamma} \right)}{\gamma} \right)}{\gamma} \right)^2 - \\ & \left[2 \, Z \, \left(- e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \, \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2} \right) \right) \right] \right] \right] - \\ & \left[- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right] \right] + \frac{1}{\gamma} \right] \right] + \frac{1}{\gamma} \left[\left(- \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2} \right) \right) \right] \right] \right] - \frac{1}{\gamma} \right] \left[\left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 + Z \, e^2 \, K_X^2 \right) \right) \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) \right] \right] \right] \right] \right] \right] \right]$$

$$\begin{split} &\left[-\frac{e^2\left(1+\frac{\gamma\epsilon^2}{2}\right)\Omega^2\,K_X^2}{1+n} - \frac{(1+n)\,e^2\left(1+\frac{\gamma\epsilon^2}{2}\right)K_X^2}{\gamma^2\,\mathcal{O}^2}\right] + \\ &e^2\,K_X^2\left(-\frac{\left(1+\frac{\gamma\epsilon^2}{2}\right)\Omega^2\left(-\left(\left(1+\frac{\gamma\epsilon^2}{2}\right)\Omega^2\right) + Z\,\varepsilon^2\,K_X^2\right)}{1+n} - \\ &-\frac{(1+n)\,\left(1+\frac{\gamma\epsilon^2}{2}\right)K_X^2\left(1+\frac{3\gamma\epsilon^2}{2} + \frac{Z\,\epsilon^2\,K_X^2}{\Omega^2}\right)}{\gamma^2}\right] + \\ &\frac{(1+n)\,e^2\left(1+\frac{\gamma\epsilon^2}{2}\right)K_X^2\left(1+\frac{\gamma\epsilon^2}{2} + \frac{Z\,\epsilon^2\,K_X^2}{\Omega^2}\right)K_Y^2}{\gamma^2} - \\ &\frac{i\,e^2\,K_X^2\,K_Y\left(\frac{i\,(1+n)\,\left(1+\frac{\gamma\epsilon^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma} + \frac{i\,(1+n)\,Z\,\epsilon^2\left(1+\frac{\gamma\epsilon^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma\,\sigma^2}\right)\right] \bigg/ \left((1+n)\right)}{\gamma\,\sigma^2} \\ &\left(-\left(\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\Omega^2\right) + Z\,\epsilon^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\Omega^2\left(-\left(\left(1+\frac{\gamma\epsilon^2}{2}\right)\Omega^2\right) + Z\,\epsilon^2\,K_X^2\right)}{1+n}\right) - \\ &\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\,K_X^2\left(1+\frac{3\gamma\,\epsilon^2}{2} + \frac{Z\,\epsilon^2\,K_X^2}{\sigma^2}\right)}{\gamma^2}\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,\epsilon^2}{2} + \frac{Z\,\epsilon^2\,K_X^2}{\sigma^2}\right)\,K_Y\left(\frac{i\,(1+n)\,\left(1+\frac{\gamma\,\epsilon^2}{2}\right)^2\,\epsilon^2\,K_Y}{\gamma} + \frac{i\,(1+n)\,Z\,\epsilon^2\left(1+\frac{\gamma\epsilon^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right)}{\gamma}\right)^2\right) - \\ &\left(2\,\left(\Omega^4 + \gamma\,\epsilon^2\,\Omega^4 + \frac{1}{4}\,\gamma^2\,\epsilon^4\,\Omega^4 - Z\,\epsilon^2\,\Omega^2\,K_X^2 - \frac{1}{2}\,Z\,\gamma\,\epsilon^4\,\Omega^2\,K_X^2\right)}{\gamma}\right) \\ &\left(1+\epsilon^2\left(1+\frac{Z\,K_X^2}{\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\,\Omega^2}\right)\right)\left(\left(-\left(\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\Omega^2\right) + Z\,\epsilon^2\,K_X^2\right) \\ &\left(-\frac{e^2\,\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\Omega^2}{1+n} - \frac{(1+n)\,e^2\,\left(1+\frac{\gamma\,\epsilon^2}{2}\right)\,K_X^2}{\gamma^2\,\Omega^2}\right) + \right. \end{aligned}\right)$$

$$\begin{split} & e^2 \, K_X^2 \left[- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, Q^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, Q^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) + \\ & \frac{\left(1 + n \right) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y^2}{\gamma^2} - \\ & \frac{i \, e^2 \, K_X^2 \, K_Y \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, G^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right) \right] / \left((1 + n) \right)}{\gamma \, \Omega^2} - \\ & \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} - \\ & \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) - \\ & \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma} \right) - \\ & \left(\Omega^4 + \gamma \, e^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, e^4 \, \Omega^4 - Z \, e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \\ & \left(1 + e^2 \, \left(1 + \frac{Z \, \left(\gamma - \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \right) \, K_X^2}{\gamma} \right) \right) \right] \left(- \left(\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \\ & \left(- \frac{e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{\left(1 + n \right) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2}{\gamma^2} \right) + \\ & e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{\left(1 + n \right) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2}{1 + n} - \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{\gamma^2} \right) - \\ & \frac{\left(1 + \frac{\gamma \, e^2}{2} \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \Omega^2 \, K_X^2}{\gamma^2} \right) \right) + \\ & \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{\gamma^2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2}{\gamma^2} \right) - \\ & \frac{\left(1 + \frac{\gamma \, e^2}{2} \, R_X^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, R_X^2 \, \Omega^2}{\gamma^2} \right) \, \Omega^2 \, \left(- \left(\frac{1 + \frac{\gamma \, e^2}{2} \, R_X^2 \, \Omega^2}{\gamma^2} \right) \, \Omega^2 \, K_X^2} \right) - \\ & \frac{\left(1 + \frac{\gamma \, e^2}{2} \, R_X^2 \, \Omega^2 \, R_X^2 \, \Omega^2 \, \Omega^2 \,$$

$$\frac{(1+n) \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{3 \cdot \gamma \cdot e^2}{2}+\frac{2 \cdot e^2 \cdot K_X^2}{\sigma^2}\right)}{\gamma^2} \right) + \\ \frac{(1+n) \left(e^2 \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{\gamma \cdot e^2}{2}+\frac{2 \cdot e^2 \cdot K_X^2}{\sigma^2}\right) K_Y^2}{\gamma^2} - \\ \frac{i \left(e^2 K_X^2 \, K_Y \left(\frac{i \cdot (1+n) \left(1 \cdot \frac{\gamma \cdot e^2}{2}\right)^2 \sigma^2 \, K_Y}{\gamma} + \frac{i \cdot (1+n) \cdot 2 \cdot e^2 \left(1 \cdot \frac{\gamma \cdot e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma}\right)}{\gamma \cdot \Omega^2} \right) \right) / \\ \left(-\left(\left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2\right) + Z \cdot e^2 \, K_X^2\right) \left(-\frac{\left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2 \left(-\left(\left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2\right) + Z \cdot e^2 \, K_X^2\right)}{\gamma \cdot 1 + n} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{3 \cdot \gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \, K_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ \frac{i \left(1+\frac{\gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \, K_X^2}{\sigma^2}\right) K_Y \left(\frac{i \cdot (1+n) \left(1+\frac{\gamma \cdot e^2}{2}\right) \alpha^2 \, K_Y}{\gamma} + \frac{i \cdot (1+n) \cdot 2 \cdot e^2 \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \, K_Y}{\gamma}\right)}{\gamma}\right)^2 + \\ Z \cdot \left(1+e^2\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2 \left(1+\frac{\gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \, K_X^2}{\Omega^2}\right) K_Y^2 \left(-\left(\left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2\right) + \frac{2 \cdot e^2 \, K_X^2}{\gamma^2}\right) - \\ Z \cdot \left(1+e^2\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2 \left(-\left(\left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2\right) + Z \cdot e^2 \, K_X^2\right) - \\ \left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2 \left(-\left(\left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2\right) + Z \cdot e^2 \, K_X^2\right) - \\ 1+n - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{3 \cdot \gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \, K_X^2}{\sigma^2}\right) K_Y^2}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2 \left(-\left(\frac{1+\frac{\gamma \cdot e^2}{2}}{2}\right) \Omega^2\right) + Z \cdot e^2 \, K_X^2}{\gamma^2}\right)}{\gamma^2} \right) + \\ \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{3 \cdot \gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \, K_X^2}{\sigma^2}\right) K_Y^2}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} \right) K_Y^2}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} \right) K_Y^2}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} + \frac{2 \cdot e^2 \, K_X^2}{\sigma^2}\right)}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) K_X^2 \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} + \frac{2 \cdot e^2 \, K_X^2}{\sigma^2}\right)}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e^2}{2}\right) \Omega^2}{\gamma^2} - \frac{\left(1+n\right) \left(1+\frac{\gamma \cdot e$$

$$\begin{split} \frac{i \, e^2 \, K_X^2 \, K_Y}{\left[\frac{i \, (1+\eta) \, \left(1+\frac{\gamma e^2}{2}\right)^2 \, G^2 \, K_Y}{\gamma} + \frac{i \, (1+\eta) \, 2 \, e^2 \, \left(1+\frac{\gamma e^2}{2}\right) \, K_Y^2 \, K_Y^2}{\gamma} \right]}{\gamma \, \Omega^2} \\ \\ \left[\gamma \left[\left(-\left(\left(1+\frac{\gamma \, e^2}{2}\right) \, Q^2 \right) + Z \, e^2 \, K_X^2 \right) \left(-\frac{\left(1+\frac{\gamma \, e^2}{2}\right) \, \Omega^2 \left(-\left(\left(1+\frac{\gamma \, e^2}{2}\right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1+\eta} \right. \right. \\ \\ \left. - \frac{(1+\eta) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_Y^2}{G^2}\right)}{\gamma^2} \right) - \frac{i \, \left(1+\frac{\gamma \, e^2}{2} + \frac{2 \, e^2 \, K_Y^2}{G^2}\right) \, K_Y}{\gamma} \left(\frac{i \, (1+\eta) \, \left(1+\frac{\gamma \, e^2}{2}\right)^2 \, G^2 \, K_Y}{\gamma} + \frac{i \, (1+\eta) \, 2 \, e^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma} \right) \right]^2}{\gamma} \right] \\ \\ \left[i \, Z \left(1+e^2 \, \left(1+\frac{Z \, K_X^2}{\left(1+\frac{\gamma \, e^2}{2}\right) \, G^2}\right) \, K_Y \left(\frac{i \, (1+\eta) \, \left(1+\frac{\gamma \, e^2}{2}\right)^2 \, G^2 \, K_Y}{\gamma} - \frac{i \, (1+\eta) \, Z \, e^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, G^2 \, K_Y}{\gamma} \right) \right] \\ \\ \left[-\left(\left(1+\frac{\gamma \, e^2}{2}\right) \, \Omega^2 \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma} \right) \left[\left(-\left(\left(1+\frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2 \right) \right. \\ \\ \left. - \frac{e^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, \Omega^2 \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, M_Y}{\gamma^2 \, \Omega^2} \right) + Z \, e^2 \, K_X^2}{1+\eta} \right] \\ \\ \left. - \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, \Omega^2 \, K_X^2 \, \left(1+\frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{G^2}\right) \, K_Y^2}{\gamma^2 \, \Omega^2} \right) + \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right) \right] \\ \\ \left. - \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{G^2}\right) \, K_Y^2}{\gamma^2} \right) + \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right) \right] \\ \\ \left. - \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right) \right] + \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right] \right] \\ \\ \left. - \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right) \right] + \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right] + \frac{\left(1+\eta\right) \, \left(1+\frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma^2} \right] \right]$$

$$\begin{split} &\left[\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)}{1+n}\right. \\ &\left. -\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_2^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_2^2}{\sigma^2}\right)\,K_Y\,\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma}\right)}{\gamma}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_2^2}{\sigma^2}\right)\,K_Y\,\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma}\right) + \frac{i\,\left(1+n\right)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right)^2\right] - \\ &\left[i\,Z\,K_X\left(\frac{i\,\Omega^2\,K_X}{\gamma}+2\,i\,e^2\,\Omega^2\,K_X+\frac{3}{4}\,i\,\gamma\,e^4\,\Omega^2\,K_X-i\,Z\,e^4\,K_X^3-\frac{i\,Z^2\,e^4\,K_X^3}{\gamma\,\Omega^2}\right)}{\gamma\,\Omega^2}\right] - \\ &\left. -\frac{i\,Z\,e^2\,K_X\,K_Y^2}{\gamma}+\frac{1}{2}\,i\,Z\,e^4\,K_X\,K_Y^2+\frac{i\,Z^2\,e^4\,K_X^3\,K_Y^2}{\gamma\,\Omega^2}\right)\left[\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+\frac{2}{2}\,e^2\,K_X^2\right)}{\gamma\,\Omega^2}\right] + \\ &\left. Z\,e^2\,K_X^2\right)\left(-\frac{e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\,K_X^2}{1+n}-\frac{\left(1+n\right)\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma^2}\right)K_X^2}{1+n}\right) + \\ &\left. e^2\,K_X^2\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)}{\gamma}\right) + \\ &\left. \frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\Omega^2}\right)\,K_Y^2}{\gamma}\right. - \\ &\left. \frac{i\,e^2\,K_X^2\,K_Y\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\,K_X}{\gamma}+\frac{i\,\left(1+n\right)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2}{\gamma}\right)}{\gamma\,\Omega^2}\right)\right] \right) \right/ \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)\left(-\left(\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2+Z\,e^2\,K_X^2}{\gamma}\right) + \frac{i\,\left(1+n\right)\,2\,e^2\,K_X^2}{\gamma}\right)}{\gamma\,\Omega^2}\right) + Z\,e^2\,K_X^2\right) - \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+n\right)\,2\,e^2\,K_X^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + Z\,e^2\,K_X^2\right) - \frac{i\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma}\right) + \frac{i\,\left(1+\frac{\gamma\,e^$$

$$\begin{split} &\frac{(1+n)\left(1+\frac{\gamma+e^2}{2}\right)K_X^2\left(1+\frac{3\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)}{\gamma^2} - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)^2\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)K_X^2K_Y}{\gamma}\right)}{\gamma} \right)^2 - \\ &\left[\left(-\left(\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2\right) + Ze^2K_X^2\right) - \left(\frac{\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2\left(-\left(\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2\right) + Ze^2K_X^2\right)}{\gamma}\right) - \frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)K_X^2\left(1+\frac{3\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)}{\gamma^2}\right) - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)^2\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)K_X^2K_Y}{\gamma}\right)}{\gamma}\right)}{\gamma} \right) + \\ &\left(2Ze^2K_X^2\left(-e^2\Omega^2K_X^2 - \frac{1}{2}\gamma e^4\Omega^2K_X^2\right)\right) / \left((1+n)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2\right) - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)^2\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)K_X^2K_Y}{\gamma}\right)}{1+n} - \\ &\frac{(1+n)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2\right) + Ze^2K_X^2\left(1+\frac{3\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)}{\gamma^2} - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2\right) + Ze^2K_X^2}{\gamma}\right)}{\gamma} - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2}{\gamma}\right) - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2}{\gamma}\right) - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_X}{\gamma}\right) - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_X}{\gamma}\right)} - \\ &\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X^2}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma} + \frac{i\left(1+n\right)Ze^2\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}\right)} - \\ &\frac{i\left(1+n\right)\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X}{G^2}\right)K_Y\left(\frac{i\left(1+n\right)}{G^2}\right)}{\gamma} - \frac{i\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}\right)} - \\ &\frac{i\left(1+\frac{\gamma+e^2}{2}+\frac{Ze^2K_X}{G^2}\right)K_Y\left(\frac{i\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}} + \frac{i\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}\right)}{\gamma} - \frac{i\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}\right)}{\gamma} - \frac{i\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}\right)} - \frac{i\left(1+\frac{\gamma+e^2}{2}\right)\Omega^2K_Y}{\gamma}} + \frac$$

$$\begin{split} & \left[2\, e^2\, K_X^2 \left(\Omega^4 + \gamma\, e^2\, \Omega^4 + \frac{1}{4}\, \gamma^2\, e^4\, \Omega^4 - Z\, e^2\, \Omega^2\, K_X^2 - \frac{1}{2}\, Z\, \gamma\, e^4\, \Omega^2\, K_X^2 \right) \right] \bigg/ \\ & \left[\left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \left(- \left(\left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \right) + Z\, e^2\, K_X^2 \right) \right. \\ & \left. \left(- \frac{\left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \left(- \left(\left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \right) + Z\, e^2\, K_X^2 \right)}{1+n} \right. \right. \\ & \left. \left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) K_X^2 \left(1 + \frac{3\, \gamma\, e^2}{2} + \frac{Z\, e^2\, K_X^2}{\alpha^2} \right) \right. \right. \\ & \left. \left. \left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) K_X^2 \left(1 + \frac{3\, \gamma\, e^2}{2} + \frac{Z\, e^2\, K_X^2}{\alpha^2} \right) \right. \right. \\ & \left. \left. \left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) K_X^2 \left((1 + \frac{3\, \gamma\, e^2}{2} + \frac{Z\, e^2\, K_X^2}{\alpha^2} \right) \right) \right. \right. \\ & \left. \left. \left. \left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) \right) K_X^2 \left((1 + \frac{3\, \gamma\, e^2}{2} + \frac{1}{4}\, \gamma^2\, e^4\, \Omega^4 - Z\, e^2\, \Omega^2\, K_X^2 - \frac{1}{2} \right. \right. \\ & \left. \left. \left. \left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) \right) K_X^2 \left((1+n) \gamma \left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \right) \right. \right. \\ & \left. \left. \left. \left((1+n) \left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \right) + Z\, e^2\, K_X^2 \right) \right. \\ & \left. \left. \left((1+n) \gamma \left(1 + \frac{\gamma\, e^2}{2} \right) K_X^2 \left(1 + \frac{3\, \gamma\, e^2}{2} + \frac{Z\, e^2\, K_X^2}{\alpha^2} \right) \right. \right. \\ & \left. \left. \left. \left. \left((1+n) \chi\, e^2 \left(1 + \frac{\gamma\, e^2}{2} \right) \Omega^2 \right) + Z\, e^2\, K_X^2 \right) \right. \\ & \left. \left. \left. \left((1+n) \chi\, e^2 \left(1 + \frac{\gamma\, e^2}{2} \right) K_X^2 \left((1+\frac{3\, \gamma\, e^2}{2} + \frac{Z\, e^2\, K_X^2}{\alpha^2} \right) \right. \right. \right. \right. \\ & \left. \left. \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) \Omega^2 \right) + Z\, e^2\, K_X^2 \right) \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) \Omega^2 \right) \right. \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \left((1+\frac{3\, \gamma\, e^2}{2} + \frac{Z\, e^2\, K_X^2}{\alpha^2} \right) \right. \right) \right. \\ & \left. \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \\ & \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right) \right. \right. \\ \left. \left. \left((1+n) \chi\, e^2 \left((1+\frac{\gamma\, e^2}{2} \right) X_X^2 \right)$$

$$\begin{split} \left\{ \gamma \left[\left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right. \\ \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^3 \, K_Y^2}{\sigma^2} \right)}{\gamma^2} \right) - \\ \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{1 \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, 2^2 \, K_Y}{\gamma} + \frac{i \, \left(1 + n \right) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{\gamma} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right) \right] - \\ \left[\left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right] \right) \right] - \\ \left[\gamma \left[\left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right) \right] \right] \right] - \\ \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, \left(1 + n \right) \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma} \right) - \\ \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma} \right) \right] - \\ \left[2 \, \left(- e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \, \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{\gamma} \right) \, \frac{1}{\gamma} \right) \right] \right) \right] \right) - \\ \left[\left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_X \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \right] \right] \right] - \\ \left[\left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_X \left(1 + \frac{Z \, K_X^2}{\gamma} \right) \, \frac{1}{\gamma} \right) \right] \right] \right] \right] - \\ \left[\left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_X \left(1 + \frac{Z \, K_X^2}{\gamma} \right) \, \frac{1}{\gamma} \right] \right] \right] - \\ \left[\left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_X \left(1 + \frac{Z \, e^2 \, K_X^2}{\gamma} \right) \, \frac{1}{\gamma} \right] \right] \right] \right] \right] - \\ \left[\left(1 + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right] \, K_X \left(1 + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \left[1 + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right] \right] \right] \right] - \\ \left[\left(1 + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_X \left(1 + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, \frac{1}{\gamma} \right] \right] \left[1 + \frac{Z \, e^2 \, K_X^$$

$$\begin{split} &\frac{(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2} \right) - \\ &\frac{\mathrm{i}\;\left(1+\frac{\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)\,\mathsf{K}_V\,\left(\frac{\mathrm{i}\;(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,\mathsf{K}_V}{\gamma}+\frac{\mathrm{i}\;(1+n)\;2\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\mathsf{K}_V}{\gamma}\right)}{\gamma}\right) \right) + \\ &\left[\mathsf{Z}\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\left(1+e^2\,\left(1+\frac{Z\,\mathsf{K}_X^2}{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)\right)\,\mathsf{K}_V^2\right) \right/ \\ &\left[\gamma\left(\left[-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\sigma^2\right)+\mathsf{Z}\,e^2\,\mathsf{K}_X^2\right)\left[-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+\mathsf{Z}\,e^2\,\mathsf{K}_X^2\right)}{1+n}\right] - \\ &\frac{(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{2}\right)}{\gamma^2}\right) - \\ &\frac{\mathrm{i}\;\left(1+\frac{\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)\,\mathsf{K}_V\,\left(\frac{\mathrm{i}\;(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,\mathsf{K}_Y}{\gamma}+\frac{\mathrm{i}\;(1+n)\;2\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\mathsf{K}_Y}{\gamma}\right)\right) \right) + \\ &\left[\mathrm{i}\;\mathsf{Z}\,e^2\,\mathsf{K}_X^2\,\mathsf{K}_V\left(-\frac{\mathrm{i}\;(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\Omega^2\,\mathsf{K}_Y}{\gamma}-\frac{\mathrm{i}\;(1+n)\;\mathsf{Z}\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\mathsf{K}_Y}{\gamma}\right)\right)\right] / \\ &\left[(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+\mathsf{Z}\,e^2\,\mathsf{K}_X^2\right)\right) - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\frac{1}{2}\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+\mathsf{Z}\,e^2\,\mathsf{K}_X^2\right)}{\gamma^2}\right) - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\mathsf{K}_Y\left(\frac{1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)\,\mathsf{K}_Y\left(\frac{\mathrm{i}\;(1+n)\;(1+\frac{\gamma\,e^2}{2})}{2}\,\sigma^2\,\mathsf{K}_Y}+\frac{\mathrm{i}\;(1+n)\;2\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\mathsf{K}_Y}{\gamma}\right)}{\gamma}\right) \right] + \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right)}{\gamma} - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right)}{\gamma} - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{2\,e^2\,\mathsf{K}_X^2}{\sigma^2}\right)}{\gamma^2}\right)}{\gamma^2} - \\ &\frac{\mathrm{i}\;\left(1+n\right)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_$$

$$\begin{split} & \left[i \left[1 + e^2 \left[1 + \frac{Z \, K_X^2}{\left(1 + \frac{v \, e^2}{2} \right) \, Q^2} \right] \right] K_Y \left[- \frac{i \, \left(1 + n \right) \, \left(1 + \frac{v \, e^2}{2} \right)^2 \, \Omega^2 \, K_Y}{\gamma} - \right. \\ & \left. \frac{i \, \left(1 + n \right) \, Z \, e^2 \, \left(1 + \frac{v \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right] \right] \bigg/ \left[\left(1 + n \right) \right. \\ & \left. \left[\left(- \left(\left(1 + \frac{v \, e^2}{2} \right) \, Q^2 \right) + Z \, e^2 \, K_X^2 \right) \left[- \frac{\left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right. \right. \\ & \left. \left. \left(- \left(1 + \frac{v \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, v \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{g^2} \right) \right. \right. \\ & \left. \left. \left(- i \, e^4 \, K_X^3 - \frac{2 \, i \, Z \, e^4 \, K_X^5}{\gamma \, \Omega^2} + \frac{i \, e^2 \, K_X \, K_Y^2}{\gamma} + \frac{1}{2} \, i \, e^4 \, K_X \, K_Y^2 + \frac{2 \, i \, Z \, e^4 \, K_X^3 \, K_Y^2}{\gamma \, \Omega^2} \right) \right] \right) \\ & \left[i \, Z \, K_X \left(- i \, e^4 \, K_X^3 - \frac{2 \, i \, Z \, e^4 \, K_X^5}{\gamma \, \Omega^2} + \frac{i \, e^2 \, K_X \, K_Y^2}{\gamma} + \frac{1}{2} \, i \, e^4 \, K_X \, K_Y^2 + \frac{2 \, i \, Z \, e^4 \, K_X^3 \, K_Y^2}{\gamma \, \Omega^2} \right] \right] \right] \\ & \left[i \, Z \, K_X \left(- i \, e^4 \, K_X^3 - \frac{2 \, i \, Z \, e^4 \, K_X^5}{\gamma \, \Omega^2} + 2 \, e^2 \, K_X^2 \right) \left. \left(- \left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right] \right) \right] \right. \\ & \left[i \, Z \, K_X \left(- i \, e^4 \, K_X^3 - \frac{2 \, i \, Z \, e^4 \, K_X^3}{\gamma} + 2 \, e^2 \, K_X^2 \right) \left. \left(- \frac{1 + \frac{v \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{2} + \frac{2 \, e^2 \, K_X^2}{\gamma} \right) \right. \right] \right. \\ & \left. \left. \left. \left(- \left(1 + \frac{v \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\alpha^2} \right) \, K_Y \left(\frac{1 \, (1 + n) \, \left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^3} \right) \right. \right. \right. \right. \\ & \left. \left. \left. \left(- \left(1 + \frac{v \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\alpha^2} \right) \, K_Y \left(\frac{1 \, (1 + n) \, \left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \, K_X}{\gamma} + \frac{1 \, i \, (1 + n) \, Z \, e^2 \, K_X^3}{\gamma} \right) \right. \right. \right. \right. \\ & \left. \left. \left. \left(- \left(1 + \frac{v \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\alpha^2} \right) \, K_Y \left(\frac{1 \, (1 + n) \, \left(1 + \frac{v \, e^2}{2} \right) \, \Omega^2 \, K_X}{\gamma} + \frac{1 \, i \, (1 + n) \, Z \, e^2 \, K_X^3}{\gamma} \right) \right. \right. \right. \\ & \left. \left. \left. \left(- \left(1 + \frac{v \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\alpha^2} \right) \, K_Y \left(\frac{1 \, v \, e^2}{\gamma} \right) \, K_Y \left(\frac{1 \, v \, e^2}{\gamma} \right) \, K_Y \left($$

$$\begin{split} &\frac{(1+n)\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{X}^{2}\left(1+\frac{3\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}} - \\ &\frac{i\left(1+\frac{\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\sigma^{2}}\right)K_{Y}\left(\frac{i\left(4+n\right)\left(4+\frac{\gamma\varepsilon^{2}}{2}\right)^{2}\Omega^{2}K_{Y}}{\gamma}+\frac{i\left(4+n\right)2\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{Y}^{2}K_{Y}}{\gamma}\right)}{\gamma}\right)\right)\right)}{\gamma} \\ & \left[2\left(\Omega^{4}+\gamma\varepsilon^{2}\Omega^{4}+\frac{1}{4}\gamma^{2}\varepsilon^{4}\Omega^{4}-Z\varepsilon^{2}\Omega^{2}K_{X}^{2}-\frac{1}{2}Z\gamma\varepsilon^{4}\Omega^{2}K_{X}^{2}\right) \\ &\left(1+\varepsilon^{2}\left(1+\frac{ZK_{X}^{2}}{\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\Omega^{2}\right)+Z\varepsilon^{2}K_{X}^{2}}\right)\right)\right)\right] - \\ &\left((1+n)\left[\left(\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\Omega^{2}\right)+Z\varepsilon^{2}K_{X}^{2}\right)\left(-\frac{\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\Omega^{2}K_{X}^{2}}{1+n}-\frac{(1+n)\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{X}^{2}}{\gamma^{2}\Omega^{2}}\right)\right)\right] \\ &\varepsilon^{2}K_{X}^{2}\left(-\frac{\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\Omega^{2}\left(-\left(\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\Omega^{2}\right)+Z\varepsilon^{2}K_{X}^{2}}{1+n}\right)}{1+n}-\frac{\left(1+n\right)\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{X}^{2}\left(1+\frac{3\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\Omega^{2}}\right)}{\gamma^{2}}\right)}{\gamma^{2}} \\ &\frac{\left(1+n\right)\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{X}^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\Omega^{2}}\right)K_{Y}^{2}}{\gamma^{2}}-\frac{\left(1+n\right)\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{X}^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\Omega^{2}}\right)}{\gamma^{2}}\right)}{\gamma^{2}} \\ &\frac{1}{\varepsilon^{2}K_{X}^{2}K_{Y}}\left(\frac{i\left(4+n\right)\left(4+\frac{\gamma\varepsilon^{2}}{2}\right)}{2}\right)^{2}\varepsilon^{2}K_{Y}}+\frac{i\left(4+n\right)Z\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)K_{X}^{2}K_{Y}}{\gamma^{2}}\right)}{\gamma^{2}}\right)}{\gamma^{2}} \\ &-\left[\left(Z\left(\Omega^{4}+\gamma\varepsilon^{2}\Omega^{4}+\frac{1}{4}\gamma^{2}\varepsilon^{4}\Omega^{4}-Z\varepsilon^{2}\Omega^{2}K_{X}^{2}-\frac{1}{2}Z\gamma\varepsilon^{4}\Omega^{2}K_{X}^{2}\right)\right] \\ &\left(1+\varepsilon^{2}\left(1+\frac{ZK_{X}^{2}}{2}\right)\Omega^{2}\right)\right] \left(-\left(\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\Omega^{2}\right)+Z\varepsilon^{2}K_{X}^{2}\right) \end{aligned}$$

$$\begin{split} & \left[-\frac{e^2 \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \omega^2 \cdot K_X^2}{1 + n} - \frac{(1 + n) \cdot e^2 \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot K_X^2}{\gamma^2 \cdot \Omega^2} \right] + \\ & e^2 \cdot K_X^2 \left(-\frac{\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2}{1 + n} \right) - \\ & - \frac{(1 + n) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot K_X^2 \cdot \left(1 + \frac{3 \cdot \gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \cdot K_X^2}{\sigma^2} \right)}{\gamma^2} \right] + \\ & \frac{\langle 1 + n \rangle \cdot e^2 \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot K_X^2 \cdot \left(1 + \frac{\gamma \cdot e^2}{2} + \frac{2 \cdot e^2 \cdot K_X^2}{\sigma^2} \right) \cdot K_Y^2}{\gamma^2} - \\ & \frac{i \cdot e^2 \cdot K_X^2 \cdot K_Y \cdot \left(\frac{i \cdot (1 + n) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right)^2 \cdot \sigma^2 \cdot K_Y}{\gamma} + \frac{i \cdot (1 + n) \cdot Z \cdot e^2 \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2}{\gamma} \right]}{\gamma \cdot \Omega^2} - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot K_X^2 \cdot \left(1 + \frac{3 \cdot \gamma \cdot e^2}{2} + \frac{Z \cdot e^2 \cdot K_X^2}{\sigma^2} \right)}{1 + n} - \\ & \frac{i \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2}{\gamma^2} \right) \left(1 + \frac{1 \cdot (1 + n) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot K_X^2 \cdot \left(1 + \frac{3 \cdot \gamma \cdot e^2}{2} + \frac{Z \cdot e^2 \cdot K_X^2}{\sigma^2} \right)}{\gamma} \right) \right]^2 \right]}{\gamma} + \\ & \left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma} - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma^2} \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma^2} \right)}{\gamma^2} \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma^2} \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma^2} \right)}{\gamma^2} \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma^2} \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \cdot \left(-\left(\left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2 \right) + Z \cdot e^2 \cdot K_X^2 \right)}{\gamma^2} \right) - \\ & \frac{\left(1 + n \right) \cdot \left(1 + \frac{\gamma \cdot e^2}{2} \right) \cdot \Omega^2$$

$$\begin{split} &\left[1+\varepsilon^{2}\left(1+\frac{Z\,K_{X}^{2}}{\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}}\right)\right]\bigg/\left[(1+n)\right] \\ &\left[\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\left[-\frac{\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{1+n}\right] - \\ &\frac{\left(1+n\right)\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{3\,Y\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{Y^{2}}\right] - \\ &\frac{i\,\left(1+\frac{Y\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\,K_{Y}\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)^{2}\,\Omega^{2}\,K_{Y}}{Y}+\frac{i\,\left(1+n\right)\,Z\,\varepsilon^{2}\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\,K_{Y}}{Y}\right)\right)\right]}{Y} \\ &\left[\left(\Omega^{4}+Y\,\varepsilon^{2}\,\Omega^{4}+\frac{1}{4}\,Y^{2}\,\varepsilon^{4}\,\Omega^{4}-Z\,\varepsilon^{2}\,\Omega^{2}\,K_{X}^{2}-\frac{1}{2}\,Z\,Y\,\varepsilon^{4}\,\Omega^{2}\,K_{X}^{2}\right) \\ &\left[1+\varepsilon^{2}\left(1+\frac{Z\,\left(Y-\left(1+n\right)\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\right)\,K_{X}^{2}}{\left(1+n\right)\,Y\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}}\right)\right]\right]\right/ \\ &\left[\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\left(-\frac{\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}}{1+n}\right)}{1+n}\right] - \\ &\frac{i\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{3\,Y\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{Y}\right] - \\ &\frac{i\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(1+\frac{Y\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{Y}\right] - \\ &\left[Z\,\left(1+\varepsilon^{2}\right)\,\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(1+\frac{Y\,\varepsilon^{2}}{2}+\frac{Z\,\varepsilon^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\,K_{Y}^{2}\right] - \left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right) - \\ &\left[Y\,\left[\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\left(-\frac{\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{1+n}\right)\right] \right) \right] \right) - \\ &\left[Y\,\left[\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\left(-\frac{\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{1+n}\right)\right] \right] \right] \right] \right] + \left[Y\,\left[\left(-\left(\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\right] \right] \right] + \left[\left(-\left(1+\frac{Y\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right) + \left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}}\right) + \left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\right)\Omega^{2}}{2}\right] + \left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\right)\Omega^{2}\right] + \left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\right)\Omega^{2}\left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\right)\Omega^{2}\right) + \left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\right)\Omega^{2}\right] + \left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\left(-\frac{(1+\frac{Y\,\varepsilon^{2}}{2})}{2}\,\Omega^{2}\right)\Omega^{2}\right$$

$$\begin{split} &\frac{(1+n)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2}+\frac{z\,\varepsilon^{2}\,\mathsf{K}_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}} \right)}{\gamma^{2}} \\ &= \frac{i\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}+\frac{z\,\varepsilon^{2}\,\mathsf{K}_{X}^{2}}{\sigma^{2}}\right)\,\mathsf{K}_{Y}\,\left(\frac{i\;(1+n)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)^{2}\,\sigma^{2}\,\mathsf{K}_{Y}}{\gamma} + \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{Y}}{\gamma}\right)}{\gamma} \right) \right)}{\gamma} \\ &= \frac{i\;\left(1+n\right)\;Z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\sigma^{2}\right) \right)\,\mathsf{K}_{Y}\left(-\frac{i\;(1+n)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)^{2}\,\sigma^{2}\,\mathsf{K}_{Y}}{\gamma} - \frac{i\;(1+n)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)^{2}\,\sigma^{2}\,\mathsf{K}_{Y}}{\gamma} - \frac{i\;(1+n)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\sigma^{2}\left(-\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)^{2}\,\sigma^{2}\,\mathsf{K}_{Y}\right) - \frac{i\;(1+n)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\sigma^{2}\right) + Z\,\varepsilon^{2}\,\mathsf{K}_{X}^{2}}{\gamma} \right)}{1+n} \\ &= \frac{\left(1+n\right)\;\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\;\mathsf{K}_{X}^{2}\left(1+\frac{3\,\gamma\,\varepsilon^{2}}{2} + \frac{Z\,\varepsilon^{2}\,\mathsf{K}_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\sigma^{2}\right) + Z\,\varepsilon^{2}\,\mathsf{K}_{X}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{Y}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{X}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{X}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{X}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{X}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\mathsf{K}_{X}^{2}\,\mathsf{K}_{X}^{2}}{\gamma} - \frac{i\;(1+n)\;z\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}$$

$$\begin{split} &\frac{i\left(1+\frac{\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}R_{x}^{2}}{\sigma^{2}}\right)\,K_{Y}\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)^{2}\sigma^{2}K_{Y}}{\gamma}+\frac{i\left(1+n\right)\,Z\,\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\,K_{X}^{2}K_{Y}}{\gamma}\right)}}{\gamma}\right)}\right)\right)}{\gamma} \\ &\left(Z\left(\Omega^{4}+\gamma\,\varepsilon^{2}\,\Omega^{4}+\frac{1}{4}\,\gamma^{2}\,\varepsilon^{4}\,\Omega^{4}-Z\,\varepsilon^{2}\,\Omega^{2}\,K_{X}^{2}-\frac{1}{2}\,Z\,\gamma\,\varepsilon^{4}\,\Omega^{2}\,K_{X}^{2}}\right)\\ &\left(1+\varepsilon^{2}\left(1+\frac{Z\,K_{X}^{2}}{\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)}\right)\right)+\\ &\left((1+n)\,\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{3\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\sigma^{2}}\right)\right)-\frac{i\left(1+n\right)\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{3\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right)-\\ &\frac{i\left(1+\frac{\gamma\varepsilon^{2}}{2}+\frac{2\varepsilon^{2}K_{X}^{2}}{\sigma^{2}}\right)\,K_{Y}\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)^{2}\sigma^{2}K_{Y}}{\gamma}+\frac{i\left(1+n\right)\,Z\,\varepsilon^{2}\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)\,R_{X}^{2}K_{Y}}{\gamma}\right)}{\gamma}\right)}{\gamma}\\ &\left(-\left[\left(Z\left(\Omega^{4}+\gamma\,\varepsilon^{2}\,\Omega^{4}+\frac{1}{4}\,\gamma^{2}\,\varepsilon^{4}\,\Omega^{4}-Z\,\varepsilon^{2}\,\Omega^{2}\,K_{X}^{2}-\frac{1}{2}\,Z\,\gamma\,\varepsilon^{4}\,\Omega^{2}\,K_{X}^{2}\right)\right.\\ &\left(1+\varepsilon^{2}\left(1+\frac{Z\,K_{X}^{2}}{\left(1+\frac{\gamma\varepsilon^{2}}{2}\right)}\,\Omega^{2}\right)\right)\left[\left(-\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)\right.\\ &\left.\left(-\frac{\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)}{1+n}\,\Omega^{2}\,K_{X}^{2}-\frac{(1+n)\,\varepsilon^{2}\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,K_{X}^{2}}{\gamma^{2}}\right)+Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{1+n}-\frac{(1+n)\,\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{\gamma\,\varepsilon^{2}}{2}\right)\,\Omega^{2}\right)-Z\,\varepsilon^{2}\,K_{X}^{2}\right)}{\gamma^{2}}\right)}{\gamma^{2}}\right)}{\gamma^{2}}\right), \end{split}$$

$$\begin{split} &\frac{(1+n)\;e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{G^2}\right)\,K_Y^2}{\gamma^2} \\ &\frac{i\;e^2\,K_X^2\,K_Y\left(\frac{i\;(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma}+\frac{i\;(1+n)\,Z\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)}{\gamma}\,K_Y^2\,K_Y}\right)}{\gamma\,\Omega^2} \right) \Bigg| \Bigg/ \left((1+n) \right. \\ &\left. \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\sigma^2\right) + Z\,e^2\,K_X^2\right) \left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)}{1+n} \right. \right. \\ &\left. -\frac{(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{3\gamma\,e^2}{2}+\frac{Z\,e^2\,K_Y^2}{G^2}\right)}{\gamma^2} \right) - \\ &\frac{i\;\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{G^2}\right)\,K_Y\left(\frac{i\;(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma} + \frac{i\;(1+n)\;Z\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_Y^2\,K_Y}{\gamma}\right)}{\gamma} \right) \Bigg|^2 \right) \Bigg| + \\ &\left[Z\,e^2\,K_X^2\left(\sigma^4+\gamma\,e^2\,\sigma^4 + \frac{1}{4}\,\gamma^2\,e^4\,\sigma^4 - Z\,e^2\,\sigma^2\,K_X^2 - \frac{1}{2}\,Z\,\gamma\,e^4\,\sigma^2\,K_X^2 \right) \right] / \\ &\left. \left((1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2 \right) \right. \\ &\left. \left. \left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2 \right)}{\gamma^2} \right. \right. \\ &\left. \left. \left(\frac{1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\frac{\gamma\,e^2}{2}\right)\,\Omega^2 + Z\,e^2\,K_X^2 \right)}{\gamma^2} \right. \\ &\left. \left. \left(\frac{1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{2\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{\gamma^2} \right. \right. \\ &\left. \left. \left. \left(\frac{1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2 + Z\,e^2\,K_X^2 \right)}{\gamma^2} \right. \right) - \\ &\left. \left. \left. \left(\frac{1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2 + Z\,e^2\,K_X^2}{\sigma^2} \right) - \frac{i\;\left(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\,K_Y^2}{\gamma^2} \right) \right. \\ &\left. \left. \left. \left(\frac{1+n}{2}\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2 + Z\,e^2\,K_X^2}{\gamma^2} \right) - \frac{i\;\left(1+n)\;\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^2}{2}\right)\,R_X^2\left(1+\frac{\gamma\,e^$$

$$\begin{split} & \left| \gamma \left[\left(- \left(\left[1 + \frac{\gamma \, \varepsilon^2}{2} \right] \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{1 + n} \right. \\ & \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) - \\ & \frac{i \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, K_Y^2}{\gamma} + \frac{i \, (1 + n) \, Z \, \varepsilon^2 \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right] \right) \right\} \\ & \left[Z \, \left(- \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2 \right) \, \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2} \right) \right) \right] \right) \right/ \left[\left(1 + n \right) \right. \\ & \left. \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(1 + \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \right. \right. \\ & \left. \left. \left(- \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(1 + \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \right. \\ & \left. \left. \left(\Omega^4 + \gamma \, \varepsilon^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, \varepsilon^4 \, \Omega^4 - Z \, \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2 \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right) \right] \right) \right/ \left. \left((1 + n) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right) \right] \right. \\ & \left. \left. \left(1 + n \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right) \right] \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right] \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right] \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right] \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right] \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \, \Omega^2 \right) \right. \right. \\ & \left. \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \,$$

$$\frac{(1+n) \left(1+\frac{\gamma e^2}{2}\right) K_X^2 \left(1+\frac{3\gamma e^2}{2}+\frac{Z e^2 K_X^2}{\alpha^2}\right)}{\gamma^2} - \frac{i \left(1+\frac{\gamma e^2}{2}+\frac{Z e^2 K_X^2}{\alpha^2}\right) K_Y \left(\frac{i \left(1+n\right) \left(1+\frac{\gamma e^2}{2}\right)^2 \alpha^2 K_Y}{\gamma}+\frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma}\right)}{\gamma} \right)}{\gamma} \right) + \frac{i \left(1+\frac{\gamma e^2}{2}+\frac{Z e^2 K_X^2}{\alpha^2}\right) K_Y \left(\frac{i \left(1+n\right) \left(1+\frac{\gamma e^2}{2}\right)^2 \alpha^2 K_Y}{\gamma}+\frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma}\right)}{\gamma} \right) \right) + \frac{i \left(1+\frac{\gamma e^2}{2}\right) \alpha^2 + Z e^2 \alpha^2 + Z e^2 \alpha^2 K_X^2 - \frac{1}{2} Z \gamma e^4 \alpha^2 K_X^2\right)}{\left(1+n\right) \gamma \left(1+\frac{\gamma e^2}{2}\right) \alpha^2 \left(-\frac{\left(1+\frac{\gamma e^2}{2}\right) \alpha^2 \left(-\frac{\left(1+\frac{\gamma e^2}{2}\right) \alpha^2\right) + Z e^2 K_X^2}{\gamma}\right)}{1+n} - \frac{i \left(1+\frac{\gamma e^2}{2}\right) \alpha^2 \left(1+\frac{\gamma e^2$$

$$\begin{split} \left[i \; Z \left[1 + \varepsilon^2 \left[1 + \frac{Z \; K_X^2}{\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2} \right] \right] K_Y \left[- \frac{i \; \left(1 + n \right) \; \left(1 + \frac{\gamma \; e^2}{2} \right)^2 \; \Omega^2 \; K_Y}{\gamma} - \frac{i \; \left(1 + n \right) \; Z \; \varepsilon^2 \left(1 + \frac{\gamma \; e^2}{2} \right) \; K_X^2 \; K_Y}{\gamma} \right] \right] / \left[\left(1 + n \right) \right] \\ & = \frac{i \; \left(1 + n \right) \; Z \; \varepsilon^2 \left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \right) + Z \; \varepsilon^2 \; K_X^2}{\gamma} \left[- \frac{\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \left(- \left(\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \right) + Z \; \varepsilon^2 \; K_X^2}{1 + n} \right) - \frac{\left(1 + n \right) \; \left(1 + \frac{\gamma \; e^2}{2} \right) \; K_X^2 \; \left(1 + \frac{3 \gamma \; e^2}{2} + \frac{Z \; e^2 \; K_Z^2}{2^2} \right)}{\gamma} \right] - \frac{i \; \left(1 + \frac{\gamma \; e^2}{2} + \frac{Z \; e^2 \; K_Z^2}{2^2} \right) \; K_Y \left(\frac{1 \; \left(1 + n \right) \; \left(1 + \frac{\gamma \; e^2}{2} \right)^2 \; \Omega^2 \; K_Y}{\gamma} + \frac{i \; \left(1 + n \right) \; Z \; e^2 \; \left(1 + \frac{\gamma \; e^2}{2} \right) \; K_Z^2 \; K_Y}{\gamma} \right) \right]}{\gamma} \right] \\ & \left[i \; Z \; K_X \left(\frac{i \; \Omega^2 \; K_X}{\gamma} + 2 \; i \; e^2 \; \Omega^2 \; K_X + \frac{3}{4} \; i \; \gamma \; e^4 \; \Omega^2 \; K_X - i \; Z \; e^4 \; K_X^2 - \frac{i \; Z^2 \; e^4 \; K_X^2}{\gamma} \; K_Y^2} \right] \right] \\ & - \frac{i \; Z \; e^2 \; K_X}{\gamma} + \frac{1}{2} \; i \; Z \; e^4 \; K_X \; K_Y^2 + \frac{i \; Z^2 \; e^4 \; K_X^2 \; K_Y^2}{\gamma} \right] \right] / \left[\left(- \left(\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \right) + Z \; e^2 \; K_X^2 \right) - \frac{i \; Z^2 \; e^4 \; K_X^2}{\gamma} \right] + Z \; e^2 \; K_X^2 \right] \\ & - \frac{i \; \left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2}{\gamma} \right] \; K_Y \left(\frac{1 \; \left(1 + n \right) \; \left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \; \left(- \left(\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \right) + Z \; e^2 \; K_X^2 \right)}{\gamma} \right] \\ & - \frac{i \; \left(1 + \frac{\gamma \; e^2}{2} \right) \; K_X^2 \left(1 + \frac{3 \; \gamma \; e^2}{2} + \frac{Z \; e^2 \; K_X^2}{\alpha^2} \right)}{\gamma} \; \Omega^2 \left(- \left(\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \right) + Z \; e^2 \; K_X^2 \right)} \\ & - \frac{i \; \left(1 + \frac{\gamma \; e^2}{2} \right) \; K_X^2 \left(1 + \frac{3 \; \gamma \; e^2}{2} + \frac{Z \; e^2 \; K_X^2}{\alpha^2} \right)}{\gamma} \; \Omega^2 \left(- \left(\left(1 + \frac{\gamma \; e^2}{2} \right) \; \Omega^2 \right) + Z \; e^2 \; K_X^2 \right)} \right] \right] \right] \right]$$

$$\left((1+n) \left(-e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \, \left| \left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right. \\ \left. \left(-\frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right. \\ \left. -\frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) - \\ \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, 2^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right) }{\gamma} \right) \\ \left(-\left[\left(Z \, \left(\Omega^4 + \gamma \, e^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, e^4 \, \Omega^4 - Z \, e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \right. \\ \left. \left(-\frac{2}{2} \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \right) \right] \left[\left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2 \right) \right. \\ \left. \left(-\frac{e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, Y \, Z}{\gamma} \right) \right. \\ \left. \left. e^2 \, K_X^2 \left(-\frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right. \\ \left. \left. -\frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2 \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, \Omega^2 \right) \right. \right. \\ \left. \left. -\frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2 \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, \Omega^2 \, X_X^2 \right) \right. \\ \left. \left. -\frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2 \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, 2 \, Z \, X_X^2 \right) \right. \right. \\ \left. \left. \left. -\frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, 2 \, Z \, X_X^2 \right) \right. \right. \\ \left. \left. \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, Z \, X_X^2 \right) \right. \right. \right. \\ \left. \left. \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right. \\ \left. \left. \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right. \\ \left. \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right. \\ \left. \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right. \\ \left. \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right. \\ \left. \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right. \\ \left. \left(1 + \frac{\gamma \, e^2}{2} \, 2 \, X_X^2 \, X_X^2 \right) \right.$$

$$\begin{split} & \left[\left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \, - \right. \\ & \left. - \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) \, - \\ & \left. - \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \sigma^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right]^2 \right) \right)}{\gamma} \\ & \left. \left(Z \, e^2 \, K_X^2 \, \left(\Omega^4 + \gamma \, e^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, e^4 \, \Omega^4 \, - Z \, e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \right) \right/ \\ & \left. \left((1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right. \\ & \left. \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right. \right. \\ & \left. \left. \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \right. \\ & \left. \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2} \right) \right. \right. \\ & \left. \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \, \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, K_X^2 \, K_Y^2 \right) \right. \right) \right] \right) \right. \\ & \left. \left. \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \, \left. \left(1 + e^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right. \right) \right. \right) \right. \\ & \left. \left. \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \, \left. \left(1 + \frac{\gamma \, e^2}{2} \, \frac{\chi^2}{2} \, \Omega^2 \right) \right. \right. \right. \right. \right. \\ & \left. \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{2} \right) \right. \\ & \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left. \left(1 + \frac{\gamma \, e^2}{2} \, \frac{\chi^2}{2} \right) \, \Omega^2 \right. \right. \right. \\ & \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) \right. \right. \\ & \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right. \right. \right. \\ & \left. \left(1 + \frac{\gamma \, e^2}{2} \right) \, \left$$

$$\begin{split} &\frac{i\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)\,K_Y\left(\frac{i\cdot(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma}+\frac{i\cdot(1+n)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right)\right)\right)}{\gamma}\\ &\left(Z\left(-e^2\,\Omega^2\,K_X^2-\frac{1}{2}\,\gamma\,e^4\,\Omega^2\,K_X^2\right)\left(1+e^2\left(1+\frac{Z\,K_X^2}{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}\right)\right)\right)\bigg/\left[(1+n)\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)}{\left(1+n\right)} - \\ &\frac{\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)}{1+n}\right)}{1+n}\right) - \\ &\frac{i\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{\gamma^2}\right)-\\ &\frac{i\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)\,K_Y\left(\frac{i\cdot(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\sigma^2\,K_Y}{\gamma}+\frac{i\cdot(1+n)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right)\right)\right)}{\gamma}\\ &\left(\Omega^4+\gamma\,e^2\,\Omega^4+\frac{1}{4}\,\gamma^2\,e^4\,\Omega^4-Z\,e^2\,\Omega^2\,K_X^2-\frac{1}{2}\,Z\,\gamma\,e^4\,\Omega^2\,K_X^2\right)}{\gamma}\right)\\ &\left(1+e^2\left(1+\frac{Z\,K_X^2}{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}\right)\right)\right)\bigg/\left((1+n)\right)\\ &\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right)+Z\,e^2\,K_X^2\right)}{1+n}\right)\\ &-\frac{(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{\gamma^2}\right)-\\ &\frac{i\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\alpha^2}\right)\,K_Y\left(\frac{i\cdot(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\Omega^2\,K_Y}{\gamma}+\frac{i\cdot(1+n)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right)}{\gamma}\right)}{\gamma}\right)\right)\right)}{\gamma}\right)}{\gamma}\\ &+\frac{1}{\gamma}$$

$$\begin{split} &\left[\left(o^4 + \gamma \, e^2 \, o^4 + \frac{1}{4} \, \gamma^2 \, e^4 \, o^4 - Z \, e^2 \, o^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, e^4 \, o^2 \, K_X^2\right) \right] \\ &\left[\left(1 + e^2 \left(1 + \frac{Z \left(\gamma - (1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right)\right) \, K_X^2}{(1+n) \, \gamma \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2}\right)\right]\right)\right] \\ &\left[\left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right) \left(-\frac{\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2 \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2}{1+n}\right) - \frac{(1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^3 \, K_X^2}{\sigma^2}\right) \, K_Y \left(\frac{i \, (1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, \alpha^2 \, K_Y}{\gamma} + \frac{i \, (1+n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma}\right) \right]}{\gamma} \right] - \\ &\left[\gamma \, \left(\left[-\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right] + Z \, e^2 \, K_X^2\right) \left[-\frac{\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2 \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right)}{1+n} - \frac{\left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right)}{\gamma}\right] - \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, K_Y \left(\frac{i \, (1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, 2^2 \, K_Y}{\gamma} + \frac{i \, (1+n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma}\right]\right]}{\gamma}\right] + \frac{i \, \left(1 + n\right) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right] \, K_Y \left(\frac{i \, (1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, 2^2 \, K_Y}{\gamma} - \frac{i \, (1+n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma}\right]}{\gamma}\right]\right] \right] \right] - \frac{i \, \left(1 + n\right) \, Z \, e^2 \, K_X^2}{\gamma} \, K_Y \left(\frac{i \, (1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, \alpha^2 \, K_Y}{\gamma}\right)}{\gamma}\right)}$$

$$\begin{split} & \left[\left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left[- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1 + n} \right] - \\ & \frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{2} \right)}{\gamma^2} \right) - \\ & \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{2^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right)^2 \, e^2 \, K_Y}{\gamma} + \frac{i \, (2 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right] \right)}{\gamma} + \\ & \left(\hat{a} \, Z \, K_X \, \left(\frac{i \, \Omega^2 \, K_X}{\gamma} + 2 \, \hat{a} \, e^2 \, \Omega^2 \, K_X + \frac{3}{4} \, \hat{a} \, \gamma \, e^4 \, \Omega^2 \, K_X - \hat{a} \, Z \, e^4 \, K_X^2 - \frac{i \, Z^2 \, e^4 \, K_X^5}{\gamma} + \frac{i \, Z^2 \, e^4 \, K_X^2}{\gamma} + \frac{i \, Z^2$$

$$\begin{split} &\frac{i\left(1+\frac{\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\,K_{Y}\left(\frac{\epsilon\,\left(24.9\right)\left(1+\frac{\gamma\,e^{2}}{\gamma}\right)^{2}\,\sigma^{2}\,K_{Y}}{\gamma}+\frac{i\,\left(24.9\right)\,Z\,e^{2}\left(2x^{\frac{\gamma\,e^{2}}{2}}\right)\,K_{X}^{2}\,K_{Y}}{\gamma}\right)}{\gamma}}\right)}{\gamma} \\ &\left(-\left[\left(Z\left(\Omega^{4}+\gamma\,e^{2}\,\Omega^{4}+\frac{1}{4}\,\gamma^{2}\,e^{4}\,\Omega^{4}-Z\,e^{2}\,\Omega^{2}\,K_{X}^{2}-\frac{1}{2}\,Z\,\gamma\,e^{4}\,\Omega^{2}\,K_{X}^{2}}\right)\right.\right.\\ &\left.\left(1+e^{2}\left(1+\frac{Z\,K_{X}^{2}}{\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}}\right)\right)\left[\left(-\left(\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\right)+Z\,e^{2}\,K_{X}^{2}\right)\right.\right.\\ &\left.\left(-\frac{e^{2}\,\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\,K_{X}^{2}}{1+n}-\frac{\left(1+n\right)\,e^{2}\,\left(1+\frac{\gamma\,e^{2}}{2}\right)\,K_{X}^{2}}{\gamma^{2}\,\Omega^{2}}\right)+Z\,e^{2}\,K_{X}^{2}}\right)\right.\\ &\left.e^{2}\,K_{X}^{2}\left(-\frac{\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\right)+Z\,e^{2}\,K_{X}^{2}}{\gamma^{2}}\right)}{1+n}-\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{2\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right)}{\gamma^{2}}\right)}{\gamma^{2}}\\ &\left.\frac{\left(1+n\right)\,e^{2}\,\left(1+\frac{\gamma\,e^{2}}{2}\right)\,K_{X}^{2}\left(1+\frac{\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)\,K_{Y}^{2}}{\gamma^{2}}\right.}{\gamma^{2}}\right]}{\gamma^{2}}\right]}{\gamma^{2}}\right]\bigg/\left(\left(1+n\right)\right.\\ &\left.\left(\left(1+n\right)\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\right)+Z\,e^{2}\,K_{X}^{2}\right)\left(-\frac{\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\left(-\left(\left(1+\frac{\gamma\,e^{2}}{2}\right)\,\Omega^{2}\right)+Z\,e^{2}\,K_{X}^{2}}{\gamma^{2}}\right)}{\gamma^{2}}\right.\right]\\ &\left.\frac{i\left(1+n\right)\left(1+\frac{\gamma\,e^{2}}{2}\right)}{\gamma^{2}}\,R_{X}^{2}\left(1+\frac{3\,\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right.\right]}{\gamma^{2}}\right]-\frac{i\left(1+n\right)\left(1+\frac{\gamma\,e^{2}}{2}\right)}{\gamma^{2}}K_{X}^{2}\left(1+\frac{3\,\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right]\\ &\left.\frac{i\left(1+n\right)\left(1+\frac{\gamma\,e^{2}}{2}\right)}{\gamma^{2}}\,R_{X}^{2}\left(1+\frac{3\,\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right.\right]}{\gamma^{2}}\right]-\frac{i\left(1+n\right)\left(1+\frac{\gamma\,e^{2}}{2}\right)}{\gamma^{2}}K_{X}^{2}\left(1+\frac{3\,\gamma\,e^{2}}{2}+\frac{Z\,e^{2}\,K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right]}{\gamma^{2}}\right]}\right)}{\gamma^{2}}\right]}{\gamma^{2}}\right]$$

$$\begin{split} \left(Z \, \varepsilon^2 \, K_X^2 \left(\Omega^4 + \gamma \, \varepsilon^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, \varepsilon^4 \, \Omega^4 - Z \, \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2 \right) \right) / \\ & \left((1+n) \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \\ & - \left(- \frac{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) }{1+n} - \frac{(1+n) \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{2 \, \varepsilon^2 \, K_X^2}{\sigma^2} \right)}{\gamma} \right) - \\ & \frac{i \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, (1+n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, 2^2 \, K_Y^2}{\gamma} + \frac{i \, (1+n) \, Z \, \varepsilon^2 \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, K_Y^2}{\gamma} \right) \right) \right) - \\ & \left(Z \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(1 + \varepsilon^2 \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2} \right) \right) \right) \right) - \\ & \left(Z \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \right) \right) \right) - \\ & \frac{i \left(1 + \eta \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \right)}{\gamma} \right) - \\ & \frac{i \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \, K_Y \left(\frac{i \, (1+n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{\gamma} \right) \right) \right) \right) + \\ & \left(Z \left(- \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2 \right) \, \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right) \right) \right) / \left((1+n) \right) \right) \right) \right) \right) - \\ & \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right) \right) / \left(1 + n \right) \right) - \\ & \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right) \right) \right) \right) - \\ & \left(- \left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, K_X^2 \right) \right) \left(- \left(1 + \frac{Z \, K_X^2}{2} \right) \, \Omega^2 \right) \right) \right) \right) \right) \right) - \\ \left(- \left(1 + \frac{\gamma \, \varepsilon^2}{2} \, \Omega^2 \, \Omega^2 \, K_X^2 \right) \right) \left(- \frac{1 + 2 \, \zeta^2}{2} \, \Omega^2 \, \Omega^2 \, \Omega^2 \, K_X^2 \right) \right) \right) \right) \right) - \\ \left(- \left(1 + \frac{\gamma \, \varepsilon^2}{2} \, \Omega^2 \, \Omega^2 \, K_X^2 \right) \right$$

$$\begin{split} &\frac{(1+n)\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{\chi\,e^3\,\mathsf{K}_X^2}{\alpha^2}\right)}{\gamma^2}\right)-\\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,\mathsf{K}_X^2}{\alpha^2}\right)\,\mathsf{K}_Y\left(\frac{1\cdot(1+n)\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\alpha^2\,\mathsf{K}_Y}{\gamma}+\frac{i\cdot(1+n)\,Z\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\,\mathsf{K}_Y}{\gamma}\right)}{\gamma}\right)\right)}{\gamma}\right)+\\ &\left(\left[\alpha^4+\gamma\,e^2\,\alpha^4+\frac{1}{4}\,\gamma^2\,e^4\,\alpha^4-Z\,e^2\,\alpha^2\,\mathsf{K}_X^2-\frac{1}{2}\,Z\,\gamma\,e^4\,\alpha^2\,\mathsf{K}_X^2\right)\right]\\ &\left[\left(1+e^2\left(1+\frac{Z\,\mathsf{K}_X^2}{\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\right)}\right)\right]\right)\bigg/\left[\left(1+n\right)\right]\\ &\left[\left(1+n\right)\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\right)+Z\,e^2\,\mathsf{K}_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\right)+Z\,e^2\,\mathsf{K}_X^2\right)}{1+n}\right.\right.\\ &\left.\frac{(1+n)\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,\mathsf{K}_X^2}{\alpha^2}\right)}{\gamma^2}\right]-\\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,\mathsf{K}_X^2}{\alpha^2}\right)\,\mathsf{K}_Y\left(\frac{i\,(1+n)\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\alpha^2\,\mathsf{K}_Y}{\gamma}+\frac{i\,(1+n)\,Z\,e^2\left(1+\frac{\gamma\,e^2}{2}\right)\,\kappa_X^2\,\mathsf{K}_Y}{\gamma}\right)}{\gamma}\right)\right]\right)}{\gamma}\\ &\left.\left(\alpha^4+\gamma\,e^2\,\alpha^4+\frac{1}{4}\,\gamma^2\,e^4\,\alpha^4-Z\,e^2\,\alpha^2\,\mathsf{K}_X^2-\frac{1}{2}\,Z\,\gamma\,e^4\,\alpha^2\,\mathsf{K}_X^2\right)}{\gamma}\right.\right.\\ &\left.\left.\left(1+e^2\left(1+\frac{Z\,\left(\gamma-(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)\right)\,\mathsf{K}_X^2}{(1+n)\,\gamma\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2}\right)\right)\right]\right)\right/\\ &\left.\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\right)+Z\,e^2\,\mathsf{K}_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\alpha^2\right)+Z\,e^2\,\mathsf{K}_X^2\right)}{1+n}\right.\right.\right.\\ &\left.\left.\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,\mathsf{K}_X^2}{\alpha^2}\right)\right.\right]-\\ &\left.\frac{(1+n)\left(1+\frac{\gamma\,e^2}{2}\right)\,\mathsf{K}_X^2\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,\mathsf{K}_X^2}{\alpha^2}\right)}{\gamma^2}\right.\right]-\right.\right.$$

$$\begin{split} &\frac{\mathrm{i} \ \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, R_X^2}{\sigma^2}\right) \ K_Y \left(\frac{\mathrm{i} \ (1+n) \left(1 + \frac{\gamma \, e^2}{2}\right) \, e^2 \, K_Y}{\gamma} + \frac{\mathrm{i} \ (1+n) \, Z \, e^3 \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, K_Y}{\gamma}\right)}{\gamma} \right)}{\gamma} \\ &- \left(Z \left(1 + e^2\right) \left(1 + \frac{\gamma \, e^2}{2}\right) \, \alpha^2 \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, K_Y^2 \right) / \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right)}{1 + n} \\ &- \frac{\left(1 + n\right) \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right)}{1 + n} \right) - \\ &- \frac{\mathrm{i} \ \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, K_Y \left(\frac{1 + (1+n) \left(1 + \frac{\gamma \, e^2}{2}\right) \, \sigma^2 \, K_Y}{\gamma} + \frac{\mathrm{i} \ (1+n) \, Z \, e^2 \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_Y^2 \, K_Y}{\gamma}\right)}{\gamma} \right) \right) + \\ &- \frac{\mathrm{i} \ \left(1 + e^2 \left(1 + \frac{Z \, K_X^2}{(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) \, K_Y \left(\frac{1 + (1+n) \left(1 + \frac{\gamma \, e^2}{2}\right) \, \sigma^2 \, K_Y}{\gamma} + \frac{\mathrm{i} \ (1+n) \, Z \, e^2 \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_Y^2 \, K_Y}{\gamma}\right)}{\gamma} \right) \right) + \\ &- \frac{\mathrm{i} \ \left(1 + n\right) \, Z \, e^2 \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_Y^2}{\sigma^2}\right)}{1 + n} - \\ &- \frac{\left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_Y^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &- \frac{\mathrm{i} \ \left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_Y \, \left(\frac{1 \, (1+n) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2 \, \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right)}{1 + n} - \\ &- \frac{\mathrm{i} \ \left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, \Omega^2 \, \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right)}{\eta^2} - \\ &- \frac{\mathrm{i} \ \left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, \Omega^2 \, \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right)}{\eta^2} - \\ &- \frac{\mathrm{i} \ \left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, \Omega^2 \, \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, \Omega^2\right) + Z \, e^2 \, K_X^2\right)}{\eta^2} \right) - \\ &- \frac{\mathrm{i} \ \left(1 + n\right) \, \left(1 + \frac{\gamma \, e^2}{2}\right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\sigma^2}\right) \, K_X^2 \, \left(-\left(\left(1 + \frac{\gamma \, e^2}{2}\right) \, R_X^2 \, K_X^2\right) \, R_X^2 \, \left(-\left(\frac{1 + \frac{\gamma \,$$

$$\left(\left[-\left(\left[1 + \frac{\gamma \, \varepsilon^2}{2} \right] \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left[-\frac{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \left(-\left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{1 + n} \right. \\ \\ \left. -\frac{\left(1 + n \right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right] - \\ \\ \left. -\frac{i \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right)^2 \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right)}{\gamma} \right) \right] \right) \right) }{\gamma} \right) \\ \left(Z^2 \, \left(\Omega^4 + \gamma \, \varepsilon^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, \varepsilon^4 \, \Omega^4 - Z \, \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2 \right) \\ \left(1 + \varepsilon^2 \, \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2} \right) \right) \right) \right) + \\ \left((1 + n) \, \left(\left[-\left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \right] - \\ \left(1 + n \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \right) - \\ \frac{i \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\sigma^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right) }{\gamma} \right)$$

$$\left(-1 - \left(\Omega^4 + \gamma \varepsilon^2 \Omega^4 + \frac{1}{4} \gamma^2 \varepsilon^4 \Omega^4 - Z \varepsilon^2 \Omega^2 K_X^2 - \frac{1}{2} Z \gamma \varepsilon^4 \Omega^2 K_X^2 \right) \right)$$

$$\left(1 + \varepsilon^2 \left(1 + \frac{Z \left(\gamma - (1+n) \left(1 + \frac{\gamma \varepsilon^2}{2} \right) \right) K_X^2}{(1+n) \gamma \left(1 + \frac{\gamma \varepsilon^2}{2} \right) \Omega^2} \right) \right)$$

$$\begin{split} & \left[-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \sigma^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^4}{\gamma^2 \, \Omega^2} \right) + \\ & e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2}{1 + n} - \frac{(1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) + \\ & \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y^2}{\gamma^2} - \frac{i \, e^2 \, K_X^2 \, K_Y \, \left(\frac{1 \, (1 + n) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right) \right]}{\gamma^2} \right] \\ & \left[\left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2}{\gamma} \right)}{1 + n} - \frac{i \, \left(1 + n \right) \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\sigma^2} \right)}{\gamma^2} \right) - \frac{i \, \left(1 + \frac{\gamma \, e^2}{2} + \frac{2 \, e^2 \, K_X^2}{\sigma^2} \right) \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right)^2}{\gamma} \right]^2}{\gamma} \\ & \left[-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(- \frac{e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \, K_X^2}{1 + n} - \frac{(1 + n) \, e^2 \, \left(1 + \frac{\gamma \, e^2}{2} \right) \, K_X^4}{\gamma^2 \, \Omega^2} \right) + e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2}{\gamma^2 \, \Omega^2} \right) - e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) - e^2 \, K_X^2 \right) - e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) - e^2 \, K_X^2 \right) - e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) - e^2 \, K_X^2 \right) - e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left(- \left(\frac{1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) - e^2 \, K_X^2 \left(- \frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \, \Omega^2 \left$$

$$\begin{split} &\frac{(1+n) \left(1+\frac{\gamma+2}{2}\right) K_X^2 \left(1+\frac{3\gamma+2}{2}+\frac{2e^2K_X^2}{2^2}\right)}{\gamma^2} + \\ &\frac{(1+n) \left(e^2 \left(1+\frac{\gamma+2}{2}\right) K_X^2 \left(1+\frac{\gamma+2}{2}+\frac{2e^2K_X^2}{2^2}\right) K_Y^2}{\gamma^2} - \\ &\frac{i \left(e^2 K_X^2 K_Y \left(\frac{1 \cdot (1+n) \left(1+\frac{\gamma+2}{2}\right)^2 \alpha^2 K_Y}{\gamma} + \frac{i \cdot (1+n) \cdot Z e^2 \left(1+\frac{\gamma+2}{2}\right) K_X^2 K_Y}{\gamma}\right)}{\gamma \cdot \Omega^2} \right) \right] \right)}{\gamma \cdot \Omega^2} \\ & \left[\sqrt{\left(-\left(\left(1+\frac{\gamma+2}{2}\right) \Omega^2\right) + Z e^2 K_X^2}\right) \left(-\frac{\left(1+\frac{\gamma+2}{2}\right) \Omega^2 \left(-\left(\left(1+\frac{\gamma+2}{2}\right) \Omega^2\right) + Z e^2 K_X^2}{\gamma}\right)}{1+n} - \frac{\left(1+n\right) \left(1+\frac{\gamma+2}{2}\right) K_X^2 \left(1+\frac{3\gamma+2}{2} + \frac{2z^2 K_X^2}{\alpha^2}\right)}{\gamma} \right) - \frac{i \cdot \left(1+\frac{\gamma+2}{2} + \frac{2e^2 K_X^2}{\alpha^2}\right) K_Y \left(\frac{i \cdot (1+n) \left(1+\frac{\gamma+2}{2}\right)^2 \alpha^2 K_Y}{\gamma} + \frac{i \cdot (1+n) \cdot Z e^2 \left(1+\frac{\gamma+2}{2}\right) K_X^2 K_Y}{\gamma}\right)}{\gamma} \right) \right]^2}{\gamma} \\ & \frac{i \cdot Z K_X \left(\frac{i \cdot \Omega^2 K_X}{\gamma} + 2 \cdot i \cdot e^2 \Omega^2 K_X + \frac{3}{4} \cdot i \cdot \gamma \cdot e^4 \Omega^2 K_X - i \cdot Z \cdot e^4 K_X^2 - \frac{i \cdot Z^2 \cdot e^4 K_X^5}{\gamma \cdot \Omega^2} + \frac{i \cdot Z^2 \cdot e^4 K_X^$$

$$\begin{split} &\frac{\mathrm{i} \ e^2 \ K_X^2 \ K_Y \left(\frac{\mathrm{i} \ (1+n) \left(1 + \frac{\gamma \epsilon^2}{2} \right) e^2 K_Y}{\gamma} + \frac{\mathrm{i} \ (1+n) \ Z e^2 \left(1 + \frac{\gamma \epsilon^2}{2} \right) K_Y^2 K_Y}{\gamma} \right)}{\gamma \, \Omega^2} \right)}{\gamma \, \Omega^2} \\ & \left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 \right) + Z \, e^2 \, K_X^2 \right) \left(-\frac{\left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 \left(-\left(\left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 \right) + Z \, e^2 \, K_X^2 \right)}{1+n} - \frac{(1+n) \left(1 + \frac{\gamma \, e^2}{2} \right) K_X^2 \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{2^2} \right)}{\gamma^2} \right) - \frac{\mathrm{i} \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\Omega^2} \right) K_Y \left(\frac{\mathrm{i} \ (1+n) \left(1 + \frac{\gamma \, e^2}{2} \right)^2 \Omega^2 K_Y}{\gamma} + \frac{\mathrm{i} \ (1+n) \ Z \, e^2 \left(1 + \frac{\gamma \, e^2}{2} \right) K_X^2 K_Y}{\gamma} \right) \right)^2 + \frac{\mathrm{i} \left(1 + n \right) \left(1 + \frac{\gamma \, e^2}{2} \right) K_X^2 \left(\Omega^4 + \gamma \, e^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, e^4 \, \Omega^4 - Z \, e^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, e^4 \, \Omega^2 \, K_X^2 \right) \right) / \left((1+n) \, \gamma \, \left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 \right) - \frac{\mathrm{i} \left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 \right) + Z \, e^2 \, K_X^2 }{\gamma} \right) - \frac{\mathrm{i} \left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 \left(K_X^2 \left(1 + \frac{3 \, \gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\Omega^2} \right) - \frac{\mathrm{i} \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\Omega^2} \right) K_Y \left(\frac{\mathrm{i} \ (1+n) \ \left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 K_Y}{\gamma} + \frac{\mathrm{i} \ (1+n) \ Z \, e^2 \left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2 K_X^2 \right)}{\gamma} \right) \right) \right) + \frac{\mathrm{i} \left(1 + \frac{\gamma \, e^2}{2} + \frac{Z \, e^2 \, K_X^2}{\Omega^2} \right) \left(1 + e^2 \left(1 + \frac{Z \left(\gamma - \left(1 + n \right) \left(1 + \frac{\gamma \, e^2}{2} \right) \right) K_X^2}{\left(1 + n \right) \gamma \, \left(1 + \frac{\gamma \, e^2}{2} \right) \Omega^2} \right) \right) \right) \right) \right) \right) \right) \right)$$

$$\begin{split} &\left[\left(-\left(\left[1+\frac{\gamma\,e^2}{2}\right]\,\Omega^2\right) + Z\,e^2\,K_X^2\right) \left[-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)}{1+n} - \right. \\ &\left. -\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\left(1+\frac{3\,\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{e^2}\right)}{\gamma^2}\right] - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{\sigma^2}\right)\,K_Y\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma^2}{2}\right)^2\,\Omega^2\,K_Y}{\gamma} + \frac{i\,\left(1+n\right)\,Z\,e^2\,\left(1+\frac{\gamma^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right) - \\ &\left[Z\,e^2\,\left(1+e^2\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,K_Y^2\right) / \\ &\left[Y\left(\left[-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)\right] - \frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2} + \frac{Z\,e^2\,K_Z^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_Z^2}{\sigma^2}\right)\,K_Y\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\Omega^2\,K_Y}{\gamma} + \frac{i\,\left(1+n\right)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right) \right] - \\ &\left[\left(1+e^2\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{\alpha^2}\right)\,K_Y^2\right) / \\ &\left[Y\left(\left[-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \frac{\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2}{\gamma^2} + Z\,e^2\,K_X^2\right)}{\gamma^2}\,K_Y\left(\frac{1+\frac{3\,\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{\sigma^2}}{\gamma}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{2}\right)\,K_Y\left(\frac{1+\frac{3\,\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{\sigma^2}}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{2}\right)\,K_Y\left(\frac{1+\frac{3\,\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y^2\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)}{\gamma^2}\right)}{\gamma^2}\right] - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2} + \frac{Z\,e^2\,K_X^2}{2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{\gamma\,e^2}{2}}{\gamma^2}\right)\,K_Y\left(\frac{1+\frac{$$

$$\begin{split} &\left[\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)}{1+n}\right. \\ &\left. -\frac{(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{e^2}\right)}{\gamma^2}\right) - \\ &\frac{i\,\left(1+\frac{\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)\,K_Y\,\left(\frac{i\,\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)^2\,\partial^2\,K_Y}{\gamma}\right) + \frac{i\,\left(1+n\right)\,Z\,e^2\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,K_Y}{\gamma}\right)}{\gamma}\right) + \\ &\left(i\,K_X\,\left(\frac{i\,\Omega^2\,K_X}{\gamma} + 2\,i\,e^2\,\Omega^2\,K_X + \frac{3}{4}\,i\,\gamma\,e^4\,\Omega^2\,K_X - i\,Z\,e^4\,K_X^2 - \frac{i\,Z^2\,e^4\,K_X^3}{\gamma\,\Omega^2}\right)\right) \right/ \\ &\left(\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)\left(-\frac{\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)}{1+n}\right) - \\ &\frac{i\,(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{\gamma}\right) - \\ &\frac{i\,(1+n)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n}\right) + \\ &\frac{i\,K_Y\,\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,G^2\,\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right)\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n}\right)\,K_Y\,\right] \right/ \\ &\left(\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n}\right]\,K_Y}\right) - \\ &\left(\left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \left(-\left(\left(1+\frac{\gamma\,e^2}{2}\right)\,\Omega^2\right) + Z\,e^2\,K_X^2\right) - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{\sigma^2}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,K_X^2}{2}\right)}{1+n} - \\ &\frac{\left(1+n\right)\,\left(1+\frac{\gamma\,e^2}{2}\right)\,K_X^2\,\left(1+\frac{3\,\gamma\,e^2}{2}+\frac{Z\,e^2\,$$

$$\frac{(1+n) \left(1+\frac{\gamma e^2}{2}\right) K_X^2 \left(1+\frac{3\gamma e^2}{2}+\frac{2e^2 K_X^2}{\sigma^2}\right)}{\gamma^2} - \frac{i \left(1+\frac{\gamma e^2}{2}+\frac{2e^2 K_X^2}{\sigma^2}\right) K_Y \left(\frac{i \left(1+n\right) \left(1+\frac{\gamma e^2}{2}\right)^2 \Omega^2 K_Y}{\gamma} + \frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma}\right)}{\gamma} \right)}{\gamma} + \frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_Y^2 K_Y}{\gamma} - \frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma} - \frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma} \right)}{\gamma} - \frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma} - \frac{i \left(1+n\right) \left(1+\frac{\gamma e^2}{2}\right) \Omega^2 + Z e^2 K_X^2}{\gamma} - \frac{i \left(1+n\right) \left(1+\frac{\gamma e^2}{2}\right) K_X^2 \left(1+\frac{3\gamma e^2}{2}+\frac{2e^2 K_X^2}{\sigma^2}\right)}{1+n} - \frac{i \left(1+\frac{\gamma e^2}{2}\right) \Omega^2 + Z e^2 K_X^2}{\gamma} - \frac{i \left(1+\frac{\gamma e^2}{2}\right) K_X^2 \left(1+\frac{3\gamma e^2}{2}+\frac{2e^2 K_X^2}{\sigma^2}\right)}{\gamma} - \frac{i \left(1+\frac{\gamma e^2}{2}\right) K_X \left(-\left(\left(1+\frac{\gamma e^2}{2}\right) \Omega^2\right) + Z e^2 K_X^2\right) K_Y}{\gamma} + \frac{i \left(1+n\right) Z e^2 \left(1+\frac{\gamma e^2}{2}\right) K_X^2 K_Y}{\gamma} - \frac{i Z K_X}{\gamma} - \frac{Z e^2 K_X}{\gamma} \left(1+\frac{3\gamma e^2}{2}+\frac{2e^2 K_X^2}{\sigma^2}\right) K_Y}{\gamma^2} - \frac{i Z e^2 K_X^2}{\gamma^2} - \frac{i Z e^2 K_X^2}{\gamma^$$

$$\begin{split} &\frac{i\left(1+\frac{\gamma e^{2}}{2}+\frac{ze^{2}K_{X}^{2}}{\sigma^{2}}\right)K_{Y}\left(\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}K_{Y}}{\gamma}+\frac{i\left(1+n\right)Ze^{2}\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}^{2}K_{Y}}{\gamma}\right)}{\gamma}\right)\right)}{\gamma} \\ &+\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}\left(-\left[\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\right)+Ze^{2}K_{X}^{2}\right)\right)}{\gamma} \\ &+\left(1+e^{2}\left(1+\frac{Z\left(\gamma-\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)\right)K_{X}^{2}}{\left(1+n\right)\gamma\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}}\right)\right)\right)\bigg/\\ &+\left(\gamma\left[\left(-\left(\left(1+\frac{\gamma e^{2}}{2}\right)\sigma^{2}\right)+Ze^{2}K_{X}^{2}\right)\left[-\frac{\left(1+\frac{\gamma e^{2}}{2}\right)\Omega^{2}\left(-\left(\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\right)+Ze^{2}K_{X}^{2}\right)}{1+n}\right]\right)\right/\\ &+\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}^{2}\left(1+\frac{3\gamma e^{2}}{2}+\frac{Ze^{2}K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}\right)-\\ &+\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}^{2}\left(1+\frac{3\gamma e^{2}}{2}+\frac{Ze^{2}K_{X}^{2}}{\sigma^{2}}\right)-\\ &+\frac{i\left(1+n\right)Z\left(1+e^{2}\right)\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}^{2}\left(1+\frac{\gamma e^{2}}{2}+\frac{Ze^{2}K_{X}^{2}}{\sigma^{2}}\right)K_{Y}^{2}\right)\bigg/}{\gamma}\\ &+\frac{i\left(1+n\right)Z\left(1+e^{2}\right)\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}+Ze^{2}K_{X}^{2}\right)\left(-\frac{\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\left(-\left(\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\right)+Ze^{2}K_{X}^{2}\right)}{1+n}-\\ &+\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}^{2}\left(1+\frac{3\gamma e^{2}}{2}+\frac{Ze^{2}K_{X}^{2}}{\sigma^{2}}\right)}{\gamma^{2}}-\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\left(1+\frac{\gamma e^{2}}{2}\right)K_{X}^{2}K_{Y}^{2}}{\gamma}\right)\bigg)\bigg/}{\gamma}\\ &+\frac{i\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\right)+Ze^{2}K_{X}^{2}}{n^{2}}\right)K_{Y}^{2}\left(\frac{1+n\left(1+n\right)\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}}{\gamma^{2}}\right)K_{Y}^{2}}\right)\bigg)\bigg/}\\ &+\frac{i\left(1+n\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}}{1+n}+\frac{i\left(1+n\left(1+\frac{\gamma e^{2}}{2}\right)G^{2}}{\gamma^{2}}\right)K_{Y}^{2}}{\gamma^{2}}\right)}{n^{2}}\bigg)\bigg/}{n^{2}}$$

$$\left(\left(-\left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right) \left(-\frac{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \, \left(-\left(\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2 \right) + Z \, \varepsilon^2 \, K_X^2 \right)}{1 + n} \right. \\ \\ \left. -\frac{\left(1 + n\right) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, \left(1 + \frac{3 \, \gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\Omega^2} \right)}{\gamma^2} \right) - \\ \\ \frac{i \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} + \frac{Z \, \varepsilon^2 \, K_X^2}{\Omega^2} \right) \, K_Y \, \left(\frac{i \, (1 + n) \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right)^2 \, \Omega^2 \, K_Y}{\gamma} + \frac{i \, (1 + n) \, Z \, \varepsilon^2 \, \left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, K_X^2 \, K_Y}{\gamma} \right)}{\gamma} \right) \right) \right) \right)}{\gamma} \\ \left(Z \, \left(\Omega^4 + \gamma \, \varepsilon^2 \, \Omega^4 + \frac{1}{4} \, \gamma^2 \, \varepsilon^4 \, \Omega^4 - Z \, \varepsilon^2 \, \Omega^2 \, K_X^2 - \frac{1}{2} \, Z \, \gamma \, \varepsilon^4 \, \Omega^2 \, K_X^2 \right) \right. \\ \left. \left(1 + \frac{Z \, K_X^2}{\left(1 + \frac{\gamma \, \varepsilon^2}{2} \right) \, \Omega^2} \right) \right) \right) \right)$$