Optical and Quantum Electronics (2024) 56:535
https://doi.org/10.1007/s11082-023-05981-5

New optical quantum hyperbolic recursional ferromagnetic microscale

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Received: 7 August 2023 / Accepted: 28 November 2023 / Published online: 30 January 2024

Abstract
In this paper, we construct properties of quasi recursional normal electromagnetic flexible elastic quasi microscale beams in terms of quasi normalized operator. We give new characterizations for ferromagnetic electric normalized quasi optimistic density with quasi frame. Finally, we design optical applications for recursional electromagnetic flexible elastic quasi microscale beam with optical quasi resonator.

Keywords Optical quantum · Quasi normal quantum · Flexible elastic microscale · Optical optimistic density

1 Introduction

Flexible optical waves and soft optical fibers are becoming ideal designs in fields of physical and optical monitoring, phase and geometric flux, motion, recursional microscale, optical interaction. The comprehensive optical geometric influences of electromagnetic flux are performed in vortex optical systems, optical modeling, and optical dynamics. Also, physical problems for optical waves are principally constructed by breaking on beaches, waves in rivers, ocean waves, ship waves, wave oscillations. Optical wave model describes propagation of recursional waves in diverse media with liquid flow, elastic fluid flow, lakes, rivers, and ocean (Vithya and Rajan 2020; Parto-haghighi and Manafian 2020; Arefin et al. 2022; Lu and Kim 2014; Ryu 2018; Zhong 2014; Sun et al. 2017; Körpınar et al. 2020a, b; Ricca 2005; Körpınar and Körpınar 2021; Körpınar et al. 2021, 2021a; Körpınar and Körpınar 2021b; Körpınar et al. 2021c).

Optical electromagnetic flux models are physical representations of the flow of electromagnetic energy in optical systems. Optical vortex filament models and optical electromagnetic flux models to gain insights into the behavior of electromagnetic fields in various systems (Diaz and Felix-Navarro 2004; Wang 2013; Sordo 2019; Qu 2018; Zhu

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2013; Fassler and Majidi 2015; Yan 2019; Körpınar and Körpınar 2021; Körpınar et al. 2021a, b; Körpınar and Körpınar 2021; Gürbüz 2005; Körpınar and Körpınar 2021; Körpınar et al. 2021a, b; Körpınar and Körpınar 2021; Körpınar et al. 2022).

Triboelectric optical waves for recursive sensing density are presented by optical applications, optical signal detection, optical imaging, PTT, and PDT. Modeling of physical models, numerical simulations, and experimental data to develop accurate representations of optical flux systems. Advances in computational techniques have been provided for quantum models, contributing to the design and optimization of a wide range of optical systems (Yu 2017; Körpınar et al. 2022; Yu 2017; Dong 2017; He 2017; Li 2014; Zhang 2017; Luo and Wang 2019; Wang et al. 2015; Guo and Ding 2008; Vieira and Horley 2012; Hasimoto 1972; Ricca 1992; Balakrishnan et al. 1993; Barros et al. 1995, 1999; Körpınar 2020; Körpınar et al. 2020, 2021a, b; Körpınar and Körpınar 2021a, b).

The organization of our paper is as follows. First, we construct properties of quasi recursional normal electromagnetic flexible elastic quasi microscale beams in terms of quasi normalized operator. We give new characterizations for ferromagnetic electric normalized quasi optimistic density with quasi frame. Finally, we obtain optical application for recursional electrical flexible elastic quasi microscale beam with optical quasi resonator.

2 Optical quasi recursional operator

Let α be quasi optical curve in the ordinary space. Then, quasi field equations are

$$\begin{aligned}\nabla_s \mathbf{t_q} &= \kappa_1 \mathbf{n_q} + \kappa_2 \mathbf{b_q},\\ \nabla_s \mathbf{n_q} &= -\kappa_1 \mathbf{t_q} + \kappa_3 \mathbf{b_q},\\ \nabla_s \mathbf{b_q} &= -\kappa_2 \mathbf{t_q} - \kappa_3 \mathbf{n_q},\end{aligned}$$

where $\kappa_1, \kappa_1, \kappa_1$ are quasi curvatures.

Lorentz fields are given by

$$\begin{aligned}\phi(\mathbf{t_q}) &= \kappa_1 \mathbf{n_q} + \chi \mathbf{b_q},\\ \phi(\mathbf{n_q}) &= -\kappa_1 \mathbf{t_q} + \kappa_3 \mathbf{b_q},\\ \phi(\mathbf{b_q}) &= -\chi \mathbf{t_q} - \kappa_3 \mathbf{n_q},\end{aligned}$$

where $\chi = \phi(\mathbf{t_q}) \cdot \mathbf{b_q}$. *Electromagnetic fields are*

$$\begin{aligned}\mathcal{B} &= \kappa_3 \mathbf{t_q} - \chi \mathbf{n_q} + \kappa_1 \mathbf{b_q},\\ \mathcal{E} &= -\frac{m}{e}\mathbf{t_q} + \kappa_1 (1 - \frac{m}{e})\mathbf{n_q} \Downarrow\Leftarrow \chi - \frac{m}{e}\kappa_2)\mathbf{b_q},\end{aligned}$$

where mass m and electric charge e of charged particle α.

Putting

$$\frac{\partial \alpha}{\partial t} = \varepsilon_1 \mathbf{t_q} + \varepsilon_2 \mathbf{n_q} + \varepsilon_3 \mathbf{b_q},$$

where $\varepsilon_1, \varepsilon_2, \varepsilon_3$ are smooth potential.

♠ *Flows quasi frame are*

$$
\begin{aligned}
\nabla_t \mathbf{t_q} &= \left(\varepsilon_1 \kappa_1 + \frac{\partial \varepsilon_2}{\partial s} - \kappa_3 \varepsilon_3 \right) \mathbf{n_q} + \left(\kappa_2 \varepsilon_1 + \frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2 \kappa_3 \right) \mathbf{b_q}, \\
\nabla_t \mathbf{n_q} &= - \left(\kappa_1 \varepsilon_1 - \varepsilon_3 \kappa_3 + \frac{\partial \varepsilon_2}{\partial s} \right) \mathbf{t_q} + \vartheta \mathbf{b_q}, \\
\nabla_t \mathbf{b_q} &= - \left(\kappa_2 \varepsilon_1 + \frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2 \kappa_3 \right) \mathbf{t_q} - \vartheta \mathbf{n_q},
\end{aligned}
$$

where ϑ is evolution potential.

※ *Optical normalization quasi operators are*

$$
\begin{aligned}
\mathcal{N}\phi(\mathbf{t_q}) &= \left(\int_\alpha (\kappa_1^2 + \kappa_2 \chi) d\sigma \right) \mathbf{t}_q + \kappa_1 \mathbf{n_q} + \chi \mathbf{b_q}, \\
\mathcal{N}\phi(\mathbf{n_q}) &= \left(\int_\alpha \kappa_2 \kappa_3 d\sigma \right) \mathbf{t}_q + \kappa_3 \mathbf{b_q}, \\
\mathcal{N}\phi(\mathbf{b_q}) &= - \left(\int_\alpha \kappa_1 \kappa_3 d\sigma \right) \mathbf{t}_q - \kappa_3 \mathbf{n_q},
\end{aligned}
$$

and

$$
\begin{aligned}
\mathcal{N}\mathcal{B} &= \left(\int_\alpha (-\chi \kappa_1 + \kappa_2 \kappa_1) d\sigma \right) \mathbf{t}_q - \chi \mathbf{n_q} + \kappa_1 \, \mathbf{b_q}, \\
\mathcal{N}\mathcal{E} &= \left(\int_\alpha \left(\kappa_1^2 \left(1 - \frac{m}{e} \right) + \left(\chi - \frac{m}{e} \kappa_2 \right) \kappa_2 \right) d\sigma \right) \mathbf{t}_q \\
&\quad + \kappa_1 \left(1 - \frac{m}{e} \right) \mathbf{n_q} + \left(\chi - \frac{m}{e} \kappa_2 \right) \mathbf{b_q}.
\end{aligned}
$$

Also, we get

$$
\begin{aligned}
\nabla_s \phi(\mathbf{t_q}) &= - (\kappa_1^2 + \kappa_2 \chi) \mathbf{t_q} + (\frac{\partial}{\partial s} \kappa_1 - \kappa_3 \chi) \mathbf{n_q} + \left(\frac{\partial}{\partial s} \chi + \kappa_1 \kappa_3 \right) \mathbf{b_q}, \\
\nabla_s \phi(\mathbf{n_q}) &= - (\frac{\partial}{\partial s} \kappa_1 + \kappa_3 \kappa_2) \mathbf{t_q} - (\kappa_1^2 + \kappa_3^2) \mathbf{n_q} + \left(\frac{\partial}{\partial s} \kappa_3 - \kappa_1 \kappa_2 \right) \mathbf{b_q}, \\
\nabla_s \phi(\mathbf{b_q}) &= (\kappa_3 \kappa_1 - \frac{\partial}{\partial s} \chi) \mathbf{t_q} - (\chi \kappa_1 + \frac{\partial}{\partial s} \kappa_3) \mathbf{n_q} - \left(\chi \kappa_2 + \kappa_3^2 \right) \mathbf{b_q}.
\end{aligned}
$$

and

$$
\begin{aligned}
\mathbf{t}_q \times \nabla_s \phi(\mathbf{t_q}) &= \left(\frac{\partial}{\partial s} \kappa_1 - \kappa_3 \chi \right) \mathbf{b_q} - \left(\frac{\partial}{\partial s} \chi + \kappa_1 \kappa_3 \right) \mathbf{n_q}, \\
\mathbf{t}_q \times \nabla_s \phi(\mathbf{n_q}) &= - \left(\kappa_1^2 + \kappa_3^2 \right) \mathbf{b_q} - \left(\frac{\partial}{\partial s} \kappa_3 - \kappa_1 \kappa_2 \right) \mathbf{n_q}, \\
\mathbf{t}_q \times \nabla_s \phi(\mathbf{b_q}) &= - \left(\chi \kappa_1 + \frac{\partial}{\partial s} \kappa_3 \right) \mathbf{b_q} + (\chi \kappa_2 + \kappa_3^2) \mathbf{n_q}.
\end{aligned}
$$

※ *Optical normalization quasi operators of above product fields are*

$$\begin{aligned}\mathcal{N}\Leftarrow\mathbf{t}_q\times\nabla_s\phi(\mathbf{t_q}))=&\Big(\int_\alpha\Big(-\Big(\frac{\partial}{\partial s}\chi+\kappa_1\kappa_3\Big)\kappa_1+\Big(\frac{\partial}{\partial s}\kappa_1-\kappa_3\chi\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q\\&-\Big(\frac{\partial}{\partial s}\chi+\kappa_1\kappa_3\Big)\mathbf{n_q}+\Big(\frac{\partial}{\partial s}\kappa_1-\kappa_3\chi\Big)\mathbf{b_q},\\
\mathcal{N}\Leftarrow\mathbf{t}_q\times\nabla_s\phi(\mathbf{n_q}))=&\Big(\int_\alpha\Big(-\Big(\frac{\partial}{\partial s}\kappa_3-\kappa_1\kappa_2\Big)\kappa_1-\big(\kappa_1^2+\kappa_3^2\big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q\\&-\Big(\frac{\partial}{\partial s}\kappa_3-\kappa_1\kappa_2\Big)\mathbf{n}_{\mathbf{q}}-(\kappa_1^2+\kappa_3^2)\mathbf{b_q},\\
\mathcal{N}\Leftarrow\mathbf{t}_q\times\nabla_s\phi(\mathbf{b_q}))=&\Big(\int_\alpha\Big(\big(\chi\kappa_2+\kappa_3^2\big)\kappa_1-\Big(\chi\kappa_1+\frac{\partial}{\partial s}\kappa_3\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q\\&+\big(\chi\kappa_2+\kappa_3^2\big)\mathbf{n_q}-\Big(\chi\kappa_1+\frac{\partial}{\partial s}\kappa_3\Big)\mathbf{b_q}.\end{aligned}$$

Then

$$\begin{aligned}\mathcal{R}\Leftarrow\phi(\mathbf{t_q}))=&-\Big(\int_\alpha\Big(-\Big(\frac{\partial}{\partial s}\chi+\kappa_1\kappa_3\Big)\kappa_1+\Big(\frac{\partial}{\partial s}\kappa_1-\kappa_3\chi\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q\\&+\Big(\frac{\partial}{\partial s}\chi+\kappa_1\kappa_3\Big)\mathbf{n_q}-\Big(\frac{\partial}{\partial s}\kappa_1-\kappa_3\chi\Big)\mathbf{b_q},\\
\mathcal{R}\Leftarrow\phi(\mathbf{n_q}))=&-\Big(\int_\alpha\Big(-\Big(\frac{\partial}{\partial s}\kappa_3-\kappa_1\kappa_2\Big)\kappa_1-\big(\kappa_1^2+\kappa_3^2\big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q\\&+\Big(\frac{\partial}{\partial s}\kappa_3-\kappa_1\kappa_2\Big)\mathbf{n}_{\mathbf{q}}+\big(\kappa_1^2+\kappa_3^2\big)\mathbf{b_q},\\
\mathcal{R}\Leftarrow\phi(\mathbf{b_q}))=&-\Big(\int_\alpha\Big(\big(\chi\kappa_2+\kappa_3^2\big)\kappa_1-\Big(\chi\kappa_1+\frac{\partial}{\partial s}\kappa_3\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q\\&-\big(\chi\kappa_2+\kappa_3^2\big)\mathbf{n_q}\\&+\Big(\chi\kappa_1+\frac{\partial}{\partial s}\kappa_3\Big)\mathbf{b_q}.\end{aligned}$$

For electromagnetic fields, we get

$$\begin{aligned}\nabla_s\mathcal{B}=&\Big(\frac{\partial}{\partial s}\kappa_3+\chi\kappa_1-\kappa_2\kappa_1\Big)\mathbf{t_q}+\Big(\kappa_3\kappa_1-\frac{\partial}{\partial s}\chi-\kappa_3\kappa_1\Big)\mathbf{n_q}\\&+\Big(\frac{\partial}{\partial s}\kappa_1-\chi\kappa_3+\kappa_3\kappa_2\Big)\mathbf{b_q}\\
\nabla_s\mathcal{E}=&-\Big(\kappa_1^2\Big(1-\frac{m}{e}\Big)+\kappa_2\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\mathbf{t_q}+\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}\\&-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\mathbf{n_q}+\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)\mathbf{b_q}\end{aligned}$$

and

$$\begin{aligned}\mathbf{t}_q\times\nabla_s\mathcal{B}=&-\Big(\frac{\partial}{\partial s}\kappa_1-\chi\kappa_3+\kappa_3\kappa_2\Big)\mathbf{n_q}+\Big(\kappa_3\kappa_1-\frac{\partial}{\partial s}\chi-\kappa_3\kappa_1\Big)\mathbf{b_q},\\
\mathbf{t}_q\times\nabla_s\mathcal{E}=&-\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)\mathbf{n_q}\\&+\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\mathbf{b_q}.\end{aligned}$$

※ *Optical normalization quasi operators of above product fields are*

$$\mathcal{N}(\mathbf{t}_q \times \nabla_s \mathcal{B}) = \Big(\int_\alpha \Big(-\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2 \Big)\kappa_1 - \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1 \Big)\kappa_2 \Big) d\sigma \Big) \mathbf{t}_q - \Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2 \Big)\mathbf{n_q} + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1 \Big)\mathbf{b_q}$$

$$\mathcal{N}(\mathbf{t}_q \times \nabla_s \mathcal{E}) = \Big(\int_\alpha \Big(-\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2 \Big)\kappa_1 + \Big(\frac{\partial}{\partial s}\kappa_1(1 - \frac{m}{e}) - \kappa_1\frac{m}{e} - \kappa_3(\chi - \frac{m}{e}\kappa_2) \Big)\kappa_2 \Big) d\sigma \Big) \mathbf{t}_q - \Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2 \Big)\mathbf{n_q} + \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big) \Big)\mathbf{b_q}.$$

※ *Recursional quasi operators of above product electromagnetic fields are*

$$\mathcal{R}\Leftarrow\mathcal{B}) = \Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2 \Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1 \Big)\kappa_2 \Big) d\sigma \Big) \mathbf{t}_q + \Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2 \Big)\mathbf{n_q} - \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1 \Big)\mathbf{b_q}$$

$$\mathcal{R}\Leftarrow\mathcal{E}\Rightarrow = \Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2 \Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big) \Big)\kappa_2 \Big) d\sigma \Big) \mathbf{t}_q \Downarrow \Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2 \Big)\mathbf{n_q} - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big) \Big)\mathbf{b_q}.$$

2.1 Recursional electromagnetical $\phi(\mathbf{t_q})$ microscale beam

※ *Quasi* $\mathbb{Q}\mathbf{n_q}$– *recursional magnetical* $\phi(\mathbf{t_q})$ *flexible elastic quasi* $\mathbb{Q}\mathbf{n_q}$–*microscale beam for quasi normal fiber is*

$$^{\mathcal{B}}_{qn}\mathcal{R}\mathcal{M}_{\phi(\mathbf{t_q})} = \mathcal{V}_b^{qn} \int \int_{\mathcal{F}} \mathcal{R}(\mathcal{B}) \cdot \mathcal{N}\nabla_t \phi(\mathbf{t_q}) d\mathcal{F},$$

where $\mathcal{V}_b^{qn}$ *is recursional quasi magnetic* $\mathbb{Q}\mathbf{n_q}$–*flexibility potential.*

Firstly, normalized operator of flexible $\phi(\mathbf{t_q})$ is

$$\mathcal{N}\nabla_t \phi(\mathbf{t_q}) = \Big(\int_\alpha \Big(\Big(-\vartheta\chi + \frac{\partial \kappa_1}{\partial t} \Big)\kappa_1 + \Big(\vartheta\kappa_1 + \frac{\partial \chi}{\partial t} \Big)\kappa_2 \Big) d\sigma \Big) \mathbf{t}_q + \Big(-\vartheta\chi + \frac{\partial \kappa_1}{\partial t} \Big)\mathbf{n_q} + \Big(\vartheta\kappa_1 + \frac{\partial \chi}{\partial t} \Big)\mathbf{b_q}.$$

where $\vartheta = \nabla_t \mathbf{n_q} \cdot \mathbf{b_q}$.

※ *Quasi optical* $\mathbb{Q}\mathbf{n_q}$– *flexible electroosmotic magnetical* $\phi(\mathbf{t_q})$ *normalized quasi optimistical density is*

$$
\begin{aligned}
{}^{\mathcal{B}}\mathcal{ND}_{\phi(\mathbf{t_q})} &= \bigg(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi \\
&-\kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\bigg)\bigg(\int_\alpha\bigg(\bigg(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\bigg)\kappa_1 + \bigg(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\bigg)\kappa_2\bigg)d\sigma\bigg) + (-\vartheta\chi \\
&+\frac{\partial\kappa_1}{\partial t}\bigg)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big) - \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\bigg(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\bigg).
\end{aligned}
$$

※ *Quasi recursional normal magnetical $\phi(\mathbf{t_q})$ flexible elastic quasi $\mathbb{Q}\mathbf{n_q}$–microscale beam is*

$$
\begin{aligned}
{}^{\mathcal{B}}\mathcal{RM}_{\phi(\mathbf{t_q})} &= \mathcal{V}_b^{qn}\int\int_{\mathcal{F}}\bigg(-\Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\bigg(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\bigg) \\
&+\bigg(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi \\
&-\kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\bigg)\bigg(\int_\alpha\bigg(\bigg(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\bigg)\kappa_1 + \bigg(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\bigg)\kappa_2\bigg)d\sigma\bigg) \\
&+\bigg(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\bigg)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\bigg)d\mathcal{F},
\end{aligned}
$$

where $\mathcal{V}_b^{qn}$ is recursional quasi normal magnetic $\mathbb{Q}\mathbf{n_q}$–flexibility potential.

※ *Quasi recursional ferromagnetic normal magnetical $\phi(\mathbf{t_q})$ flexible elastic quasi microscale beam is*

$$
{}^{\mathcal{B}}\mathcal{RM}^*_{\phi(\mathbf{t_q})} = \mathcal{V}_b^{qn}\int\int_{\mathcal{F}}\mathcal{R}(\mathcal{B})\cdot\mathcal{N}(\phi\big(\mathbf{t_q}\big)\times\nabla^2_{\mathbf{t_q}}\phi(\mathbf{t_q}))d\mathcal{F},
$$

where $\mathcal{V}_b^{qn}$ is recursional quasi normal magnetic flexibility potential.

By quasi model, we get

$$
\begin{aligned}
\mathcal{N}\Big(\phi\big(\mathbf{t_q}\big)\times\nabla_{\mathbf{t_q}}\phi\big(\mathbf{t_q}\big)\Big) &= \bigg(\int_\alpha\big(-\chi\big(\kappa_1^2+\kappa_2\chi\big)\kappa_1 + \kappa_1\big(\kappa_1^2 \\
&+\kappa_2\chi\big)\kappa_2\big)d\sigma\bigg)\mathbf{t}_q - \chi\big(\kappa_1^2+\kappa_2\chi\big)\mathbf{n_q}+\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\mathbf{b_q}.
\end{aligned}
$$

Optical ferromagnetic $\phi(\mathbf{t_q})$ magnetic $\mathbb{Q}\mathbf{n_q}$–optimistic density, we obtain

$$
\begin{aligned}
{}^{\mathcal{B}}\mathcal{ND}^*_{\phi(\mathbf{t_q})} &= \bigg(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi \\
&-\kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\bigg)\bigg(\int_\alpha\big(-\chi\big(\kappa_1^2+\kappa_2\chi\big)\kappa_1 + \kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\kappa_2\big)d\sigma\bigg) - \chi\big(\kappa_1^2 \\
&+\kappa_2\chi\big)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big) - \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\kappa_1\big(\kappa_1^2+\kappa_2\chi\big).
\end{aligned}
$$

※ *Quasi recursional ferromagnetic normal magnetical $\phi\big(\mathbf{t_q}\big)$ viscoelastic quasi microscale beam is*

$$
\begin{aligned}
&{}^{\mathcal{B}}\mathcal{RM}^{*}_{\phi(\mathbf{t_q})} = \mathcal{V}_b^{qn} \int\int_{\mathcal{F}} \Big(-\chi\big(\kappa_1^2+\kappa_2\chi\big)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\\
&+\Big(\int_{\alpha}\Big(\Big(\frac{\partial}{\partial s}\kappa_1\\
&-\chi\kappa_3 + \kappa_3\kappa_2\big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_{\alpha}\big(-\chi\big(\kappa_1^2+\kappa_2\chi\big)\kappa_1\\
&+\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\kappa_2\big)d\sigma\big) - \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\Big)d\mathcal{F}.
\end{aligned}
$$

※ *Quasi recursional normal electrical $\phi(\mathbf{t_q})$ flexible elastic quasi $\mathbb{Q}\mathbf{n_q}$–microscale beam is*

$$
{}^{\mathcal{E}}\mathcal{RM}_{\phi(\mathbf{t_q})}\mathcal{V}_{\varepsilon}^{qn} \int\int_{\mathcal{F}} \mathcal{R}(\mathcal{E})\cdot\mathcal{N}\nabla_t\phi\big(\mathbf{t_q}\big)d\mathcal{F},
$$

where $\mathcal{V}_{\varepsilon}^{qn}$ is recursional quasi normal magnetic electric potential.

※ *Optical quasi flexible $\mathbb{Q}\mathbf{n_q}$–electroosmotic electrical $\phi(\mathbf{t_q})$ normalized $\mathbb{Q}\mathbf{n_q}$– optimistic density is*

$$
\begin{aligned}
&{}^{\mathcal{E}}\mathcal{ND}_{\phi(\mathbf{t_q})} = \Big(\int_{\alpha}\Big(\Big(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\Big)\kappa_1 + \Big(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_{\alpha}\Big(\Big(\frac{\partial}{\partial s}(\chi\\
&-\frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3(\chi\\
&-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big) + \Big(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\Big)\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3\\
&-\frac{m}{e}\kappa_2\Big) - (\frac{\partial}{\partial s}\kappa_1(1 - \frac{m}{e}) - \kappa_1\frac{m}{e} - \kappa_3(\chi - \frac{m}{e}\kappa_2))(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}).
\end{aligned}
$$

※ *Quasi recursional normal electrical $\phi(\mathbf{t_q})$ flexible elastic quasi microscale beam is*

$$
\begin{aligned}
&{}^{\mathcal{E}}\mathcal{RM}_{\phi(\mathbf{t_q})} = \mathcal{V}_{\varepsilon}^{qn} \int\int_{\mathcal{F}} \Big(-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\Big(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\Big)\\
&+\Big(\int_{\alpha}\Big(\Big(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\Big)\kappa_1 + \Big(\vartheta\kappa_1 + \frac{\partial\chi}{\partial t}\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_{\alpha}\Big(\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big)\\
&+\kappa_1(1 - \frac{m}{e})\kappa_3 - \frac{m}{e}\kappa_2\Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\\
&+\Big(-\vartheta\chi + \frac{\partial\kappa_1}{\partial t}\Big)\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\Big)d\mathcal{F},
\end{aligned}
$$

where $\mathcal{V}_{\varepsilon}^{qn}$ is recursional quasi normal magnetic electric potential.

Normalized quasi ferromagnetic $\phi(\mathbf{t_q})$ electric quasi optimistic density is

$$
\begin{aligned}
{}^{\mathcal{E}}\mathcal{ND}^{*}_{\phi(\mathbf{t_q})} &= -\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\\
&+\Big(\int_\alpha\big(-\chi\big(\kappa_1^2+\kappa_2\chi\big)\kappa_1+\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\kappa_2\big)d\sigma\Big)\Big(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1(1\\
&-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)\kappa_1-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\\
&-\chi\big(\kappa_1^2+\kappa_2\chi\big)\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big).
\end{aligned}
$$

※ *Quasi recursional ferromagnetic normal electrical $\phi(\mathbf{t_q})$ flexible elastic quasi microscale beam is*

$$
\begin{aligned}
{}^{\mathcal{E}}\mathcal{RM}^{*}_{\phi(\mathbf{t_q})} &= \mathcal{V}_{\varepsilon}^{qn}\int\int_{\mathcal{F}}\Big(-\chi\big(\kappa_1^2+\kappa_2\chi\big)\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)\\
&-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)+\Big(\int_\alpha\big(-\chi\big(\kappa_1^2\\
&+\kappa_2\chi\big)\kappa_1+\kappa_1\big(\kappa_1^2+\kappa_2\chi\big)\kappa_2\big)d\sigma\Big)\Big(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3\\
&-\frac{m}{e}\kappa_2\Big)\kappa_1-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big)d\mathcal{F}.
\end{aligned}
$$

Optical quasi model for ferromagnetical normal recursional electric $\phi(\mathbf{t_q})$ flexible elastic quasi $\mathbb{Q}$ $\mathbf{n_q}$–microscale beam with optical ring quasi resonator is illustrated in Fig. 1.

2.2 Recursional electromagnetical $\phi(\mathbf{n_q})$ microscale beam

※ *Quasi recursional normal magnetic $\phi(\mathbf{n_q})$ flexible elastic quasi $\mathbb{Q}\mathbf{n_q}$–microscale beam is presented*

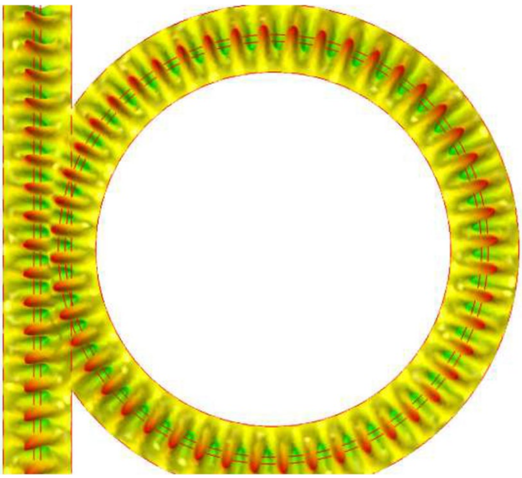

Fig. 1 Optical ferromagnetic normal recursional electric $\phi(\mathbf{t_q})$ microscale beam

$$^{\mathcal{B}}\mathcal{RM}_{\phi(\mathbf{n_q})} = \mathcal{V}_b^{qn} \int\int_{\mathcal{F}} \mathcal{R}{\Leftarrow}\mathcal{B}) \cdot \mathcal{N}\nabla_t \phi(\mathbf{n_q}) d\mathcal{F},$$

where $\mathcal{V}_b^{qn}$ *is recursional quasi normal magnetic* $\mathbb{Q}\mathbf{n_q}$*–flexibility potential.*

Quasi normalize operator for flexible $\phi(\mathbf{n_q})$ is

$$\mathcal{N}\nabla_t \phi(\mathbf{n_q}) = \Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial\varepsilon_2}{\partial s} - \varepsilon_3\kappa_3 + \kappa_1\varepsilon_1\Big)\kappa_1 + \vartheta\kappa_3\Big)\kappa_1 + \Big(\frac{\partial\kappa_3}{\partial t} - \kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big)\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q - \Big(\Big(\frac{\partial\varepsilon_2}{\partial s} - \varepsilon_3\kappa_3 + \kappa_1\varepsilon_1\Big)\kappa_1 + \vartheta\kappa_3\Big)\mathbf{n_q} + \Big(\frac{\partial\kappa_3}{\partial t} - \kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big)\Big)\mathbf{b_q}.$$

Magnetic normalize quasi $\mathbb{Q}\mathbf{n_q}$–optimistic density is

$$^{\mathcal{B}}\mathcal{ND}_{\phi(\mathbf{n_q})} = \Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial\varepsilon_2}{\partial s} - \varepsilon_3\kappa_3 + \kappa_1\varepsilon_1\Big)\kappa_1 + \vartheta\kappa_3\Big)\kappa_1 + \Big(\frac{\partial\kappa_3}{\partial t} - \kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big)\Big)\kappa_2\Big)d\sigma\Big) - \Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\Big(\Big(\frac{\partial\varepsilon_2}{\partial s} - \varepsilon_3\kappa_3 + \kappa_1\varepsilon_1\Big)\kappa_1 + \vartheta\kappa_3\Big) - \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\Big(\frac{\partial\kappa_3}{\partial t} - \kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big)\Big)$$

※ *Quasi recursional normal magnetical* $\phi(\mathbf{n_q})$ *flexible elastic quasi microscale beam is*

$$^{\mathcal{B}}\mathcal{RM}_{\phi(\mathbf{n_q})} = \mathcal{V}_b^{qn} \int\int_{\mathcal{F}} \Big(-\Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\Big(\frac{\partial\kappa_3}{\partial t} - \kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big)\Big) + \Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial\varepsilon_2}{\partial s} - \varepsilon_3\kappa_3 + \kappa_1\varepsilon_1\Big)\kappa_1 + \vartheta\kappa_3\Big)\kappa_1 + \Big(\frac{\partial\kappa_3}{\partial t} - \kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big)\Big)\kappa_2\Big)d\sigma\Big) - \Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\Big(\Big(\frac{\partial\varepsilon_2}{\partial s} - \varepsilon_3\kappa_3 + \kappa_1\varepsilon_1\Big)\kappa_1 + \vartheta\kappa_3\Big)\Big)d\mathcal{F},$$

where $\mathcal{V}_b^{qn}$ *is recursional quasi normal magnetic* $\mathbb{Q}\mathbf{n_q}$*–flexibility potential.*

※ *Quasi recursional ferromagnetic normal magnetical* $\phi(\mathbf{n_q})$ *flexible elastic quasi microscale beam is presented*

$$^{\mathcal{B}}\mathcal{RM}^*_{\phi(\mathbf{t_q})} = \mathcal{V}_b^{qn} \int\int_{\mathcal{F}} \mathcal{R}{\Leftarrow}\mathcal{B}) \cdot \mathcal{N}(\phi(\mathbf{n_q}) \times \nabla^2_{\mathbf{t_q}} \phi(\mathbf{n_q})) d\mathcal{F},$$

where $\mathcal{V}_b^{qn}$ *is recursional quasi normal magnetic flexibility potential.*

Normalized calculations, we get

$$\mathcal{N}\Big(\phi(\mathbf{n_q})\times\nabla^2_{\mathbf{t_q}}\phi(\mathbf{n_q})\Big)=\Bigg(\int_\alpha\Bigg(\Bigg(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Bigg)\Bigg)\kappa_1$$
$$+\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\kappa_2\big)d\sigma\big)\mathbf{t}_q+\Bigg(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Bigg)\mathbf{n_q}+\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\mathbf{b_q}.$$

Ferromagnetic quasi normalized $\phi(\mathbf{n_q})$ optimistic density is

$$^{\mathcal{B}}\mathcal{ND}^*_{\phi(\mathbf{n_q})}=\Bigg(\int_\alpha\Bigg(\Bigg(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Bigg)\Bigg)\kappa_1+\big(\kappa_1^2$$
$$+\kappa_3^2\big)\kappa_1\kappa_2\big)d\sigma\Big)\Bigg(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\kappa_1-\chi\kappa_3+\kappa_3\kappa_2\Big)\kappa_1+\Big(\kappa_3\kappa_1-\frac{\partial}{\partial s}\chi$$
$$-\kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)+\Bigg(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Bigg)\Big(\frac{\partial}{\partial s}\kappa_1$$
$$-\chi\kappa_3+\kappa_3\kappa_2\Big)-\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\Big(\kappa_3\kappa_1-\frac{\partial}{\partial s}\chi-\kappa_3\kappa_1\Big).$$

⋇ *Quasi recursional ferromagnetic normal magnetical* $\phi(\mathbf{n_q})$ *flexible elastic quasi microscale beam is*

$$^{\mathcal{B}}\mathcal{RM}^*_{\phi(\mathbf{t_q})}=\mathcal{V}_b^{qn}\int\int_{\mathcal{F}}\Bigg(\Bigg(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Bigg)\Big(\frac{\partial}{\partial s}\kappa_1$$
$$-\chi\kappa_3+\kappa_3\kappa_2\Big)+\Bigg(\int_\alpha\Bigg(\Bigg(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Bigg)\Bigg)\kappa_1+\big(\kappa_1^2$$
$$+\kappa_3^2\big)\kappa_1\kappa_2\big)d\sigma\Big)\Bigg(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\kappa_1-\chi\kappa_3+\kappa_3\kappa_2\Big)\kappa_1+\Big(\kappa_3\kappa_1-\frac{\partial}{\partial s}\chi$$
$$-\kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)-\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\Big(\kappa_3\kappa_1-\frac{\partial}{\partial s}\chi-\kappa_3\kappa_1\Big)\Big)d\mathcal{F}.$$

⋇ *Quasi recursional normal electrical* $\phi(\mathbf{n_q})$ *quasi microscale beam is presented*

$$^{\mathcal{E}}\mathcal{RM}_{\phi(\mathbf{n_q})}=\mathcal{V}_\varepsilon^{qn}\int\int_{\mathcal{F}}\mathcal{R}(\mathcal{E})\cdot\mathcal{N}\nabla_t\phi\big(\mathbf{n_q}\big)d\mathcal{F},$$

where $\mathcal{V}_\varepsilon^{qn}$ *is recursional quasi normal magnetic electric potential.*

Quasi normalize electric $\mathbb{Q}\mathbf{n_q}$–optimistic $\phi(\mathbf{n_q})$ density is

$$^{\mathcal{E}}\mathcal{ND}_{\phi(\mathbf{n_q})}=\Bigg(\int_\alpha\Bigg(-\Bigg(\Bigg(\frac{\partial\varepsilon_2}{\partial s}-\varepsilon_3\kappa_3+\kappa_1\varepsilon_1\Bigg)\kappa_1+\vartheta\kappa_3\Bigg)\kappa_1+\Bigg(\frac{\partial\kappa_3}{\partial t}-\kappa_1\Bigg(\frac{\partial\varepsilon_3}{\partial s}$$
$$+\varepsilon_2\kappa_3+\kappa_2\varepsilon_1\big)\big)\kappa_2\big)d\sigma\Big)\Bigg(\int_\alpha\Big(\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)\kappa_1$$
$$-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)-\Bigg(\Bigg(\frac{\partial\varepsilon_2}{\partial s}-\varepsilon_3\kappa_3$$
$$+\kappa_1\varepsilon_1\big)\kappa_1+\vartheta\kappa_3\big)\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)-\Big(\frac{\partial}{\partial s}\kappa_1(1$$
$$-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\Bigg(\frac{\partial\kappa_3}{\partial t}-\kappa_1\Bigg(\frac{\partial\varepsilon_3}{\partial s}+\varepsilon_2\kappa_3+\kappa_2\varepsilon_1\Bigg)\Bigg).$$

※ *Quasi recursional normal electrical $\phi(\mathbf{n_q})$ flexible elastic quasi microscale beam is presented*

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{RM}_{\phi(\mathbf{n_q})} &= \mathcal{V}_{\varepsilon}^{qn}\int\int_{\mathcal{F}}\Big(-\Big(\Big(\frac{\partial\varepsilon_2}{\partial s}-\varepsilon_3\kappa_3+\kappa_1\varepsilon_1\Big)\kappa_1+\vartheta\kappa_3\Big)\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)\\
&+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)+\Big(\int_{\alpha}\Big(-\Big(\Big(\frac{\partial\varepsilon_2}{\partial s}-\varepsilon_3\kappa_3+\kappa_1\varepsilon_1\Big)\kappa_1+\vartheta\kappa_3\Big)\kappa_1\\
&+\Big(\frac{\partial\kappa_3}{\partial t}-\kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s}+\varepsilon_2\kappa_3+\kappa_2\varepsilon_1\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_{\alpha}\Big(\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3\\
&-\frac{m}{e}\kappa_2\Big)\kappa_1-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\\
&-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\Big(\frac{\partial\kappa_3}{\partial t}-\kappa_1\Big(\frac{\partial\varepsilon_3}{\partial s}+\varepsilon_2\kappa_3+\kappa_2\varepsilon_1\Big)\Big)\Big)d\mathcal{F},
\end{aligned}
$$

where $\mathcal{V}_{\varepsilon}^{qn}$ is recursional quasi normal magnetic electric potential.

Electric quasi optimistic density is

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{ND}^{*}_{\phi(\mathbf{n_q})} &= \Big(\int_{\alpha}\Big(\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)\kappa_1-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)\\
&-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_{\alpha}\Big(\Big(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Big)\kappa_1\\
&+\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\kappa_2\big)d\sigma\big)+\Big(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Big)\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)\\
&+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\big(\kappa_1^2+\kappa_3^2\big)\kappa_1.
\end{aligned}
$$

※ *Optical ferromagnetical recursional electrical $\phi(\mathbf{n_q})$ flexible elastic quasi $\mathbb{Q}\mathbf{n_q}$–microscale beam is constructed*

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{RM}^{*}_{\phi(\mathbf{n_q})} &= \mathcal{V}_{\varepsilon}^{qn}\int\int_{\mathcal{F}}\Big(\Big(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}-\kappa_2\kappa_1\Big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Big)\Big(\frac{\partial}{\partial s}(\chi\\
&-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3-\frac{m}{e}\kappa_2\Big)+\Big(\int_{\alpha}\Big(\Big(\frac{\partial}{\partial s}\Big(\chi-\frac{m}{e}\kappa_2\Big)+\kappa_1\Big(1-\frac{m}{e}\Big)\kappa_3\\
&-\frac{m}{e}\kappa_2\Big)\kappa_1-\Big(\frac{\partial}{\partial s}\kappa_1\Big(1-\frac{m}{e}\Big)-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_{\alpha}\Big(\Big(\kappa_1\Big(\frac{\partial\kappa_3}{\partial s}\\
&-\kappa_2\kappa_1\big)+\kappa_3\Big(\frac{\partial\kappa_1}{\partial s}+\kappa_2\kappa_3\Big)\Big)\kappa_1+\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\kappa_2\Big)d\sigma\Big)\\
&-\Big(\frac{\partial}{\partial s}\kappa_1(1-\frac{m}{e})-\kappa_1\frac{m}{e}-\kappa_3\Big(\chi-\frac{m}{e}\kappa_2\Big)\Big)\big(\kappa_1^2+\kappa_3^2\big)\kappa_1\Big)d\mathcal{F}.
\end{aligned}
$$

Optical quasi model for ferromagnetic normal recursional electric $\phi(\mathbf{n_q})$ flexible elastic quasi normal $\mathbb{Q}\mathbf{n_q}$–microscale beam with optical ring quasi resonator is illustrated in Fig. 2.

2.3 Recursional electromagnetical $\phi(\mathbf{b_q})$ microscale beam

Quasi normalize operator for flexible $\phi(\mathbf{b_q})$ is

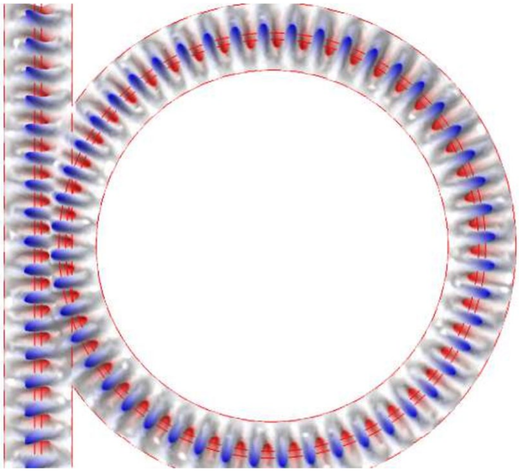

Fig. 2 Optical ferromagnetic normal recursional electric $\phi(\mathbf{n_q})$ microscale beam

$$\mathcal{N}\nabla_t\phi(\mathbf{b_q}) = \Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial \varepsilon_2}{\partial s}-\kappa_3\varepsilon_3+\kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\kappa_1 - \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) +\vartheta\kappa_3\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q - \Big(\Big(\frac{\partial \varepsilon_2}{\partial s}-\kappa_3\varepsilon_3+\kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\mathbf{n_q} - \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\mathbf{b_q}.$$

Normalized electrical optimistic $\phi(\mathbf{b_q})$ density is

$$^{\mathcal{B}}\mathcal{ND}_{\phi(\mathbf{b_q})} = \Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi -\kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial \varepsilon_2}{\partial s}-\kappa_3\varepsilon_3+\kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\kappa_1 - \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} +\varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q - \Big(\Big(\frac{\partial \varepsilon_2}{\partial s}-\kappa_3\varepsilon_3+\kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\Big(\frac{\partial \kappa_1}{\partial s} -\chi\kappa_3 + \kappa_3\kappa_2\Big) + \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big).$$

⋇ *Quasi recursional ferromagnetic normal magnetical $\phi(\mathbf{b_q})$ flexible elastic quasi microscale beam is constructed*

$$^{\mathcal{B}}\mathcal{RM}_{\phi(\mathbf{b_q})} = \mathcal{V}_b^{qn}\int\int_{\mathcal{F}} \Big(\Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big) +\Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1 + \Big(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial \varepsilon_2}{\partial s} -\kappa_3\varepsilon_3+\kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\kappa_1 - \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q -\Big(\Big(\frac{\partial \varepsilon_2}{\partial s}-\kappa_3\varepsilon_3+\kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\Big)d\mathcal{F},$$

where $\mathcal{V}_b^{qn}$ is recursional quasi normal magnetic $\mathbb{Q}\mathbf{n_q}$–flexibility potential.

※ *Quasi recursional ferromagnetic normal magnetical $\phi(\mathbf{b_q})$ flexible elastic quasi $\mathbb{Q}\mathbf{n_q}$− microscale beam is defined*

$$^{\mathcal{B}}\mathcal{RM}^{*}_{\phi(\mathbf{b_q})} = \mathcal{V}_b^{qn} \int\int_{\mathcal{F}} \mathcal{R} \Leftarrow \mathcal{B}) \cdot \mathcal{N}(\phi(\mathbf{b_q}) \times \nabla^2_{\mathbf{t_q}} \phi(\mathbf{b_q})) d\mathcal{F},$$

where $\mathcal{V}_b^{qn}$ is recursional quasi normal magnetic flexibility potential.

Quasi normalized operator is

$$\mathcal{N}\Big(\phi\big(\mathbf{b_q}\big) \times \nabla_{\mathbf{t_q}} \phi\big(\mathbf{b_q}\big)\Big) = -\left(\int_\alpha \left(\chi\big(\chi\kappa_2 + \kappa_3^2\big)\kappa_1 + \kappa_3\left(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)\right)\kappa_2\right) d\sigma\Bigg)\mathbf{t}_q$$
$$-\chi\big(\chi\kappa_2 + \kappa_3^2\big)\mathbf{n_q} + \left(\chi\left(\frac{\partial \kappa_3}{\partial s} + \chi\kappa_1\right) - \kappa_3\left(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)\right)\mathbf{b_q}.$$

Since

$$^{\mathcal{B}}\mathcal{ND}^{*}_{\phi(\mathbf{b_q})} = -\left(\int_\alpha \left(\chi\big(\chi\kappa_2 + \kappa_3^2\big)\kappa_1 + \kappa_3\left(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)\right)\kappa_2\right) d\sigma)\Bigg(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3$$
$$+\kappa_3\kappa_2\Big)\kappa_1 + \left(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\right)\kappa_2\Big)d\sigma\Bigg) - \chi\big(\chi\kappa_2 + \kappa_3^2\big)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3$$
$$+\kappa_3\kappa_2\Big) - \left(\chi\left(\frac{\partial \kappa_3}{\partial s} + \chi\kappa_1\right) - \kappa_3\left(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)\right)\left(\kappa_3\kappa_1 - \frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)$$

※ *Quasi recursional ferromagnetic normal magnetical $\phi(\mathbf{b_q})$ flexible elastic quasi microscale beam is*

$$^{\mathcal{B}}\mathcal{RM}^{*}_{\phi(\mathbf{b_q})} = \mathcal{V}_b^{qn} \int\int_{\mathcal{F}} \left(-\left(\chi\left(\frac{\partial \kappa_3}{\partial s} + \chi\kappa_1\right) - \kappa_3\left(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)\right)\left(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\right)\right.$$
$$-\left(\int_\alpha \left(\chi\big(\chi\kappa_2 + \kappa_3^2\big)\kappa_1 + \kappa_3\left(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\right)\right)\kappa_2\right) d\sigma\Bigg)\Bigg(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\kappa_1$$
$$+\left(\kappa_3\kappa_1 - \frac{\partial}{\partial s}\chi - \kappa_3\kappa_1\right)\kappa_2\Big)d\sigma\Bigg) - \chi\big(\chi\kappa_2 + \kappa_3^2\big)\Big(\frac{\partial}{\partial s}\kappa_1 - \chi\kappa_3 + \kappa_3\kappa_2\Big)\Big)d\mathcal{F},$$

※ *Quasi recursional normal electrical $\phi(\mathbf{b_q})$ quasi microscale beam is defined*

$$^{\mathcal{E}}\mathcal{RM}_{\phi(\mathbf{b_q})} = \mathcal{V}_\varepsilon^{qn} \int\int_{\mathcal{F}} \mathcal{R} \Leftarrow \mathcal{E} \Rightarrow \cdot \mathcal{N} \nabla_t \phi\big(\mathbf{b_q}\big) d\mathcal{F},$$

where $\mathcal{V}_\varepsilon^{qn}$ is recursional quasi normal magnetic electric potential.

Quasi electric optimistic density is

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{ND}_{\phi(\mathbf{b_q})} = &\Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1(1 \\
&-\frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial \varepsilon_2}{\partial s} - \kappa_3\varepsilon_3 + \kappa_1\varepsilon_1\Big)\chi \\
&+\frac{\partial \kappa_3}{\partial t}\Big)\kappa_1 - \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\kappa_2\Big)d\sigma\Big) - \Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) \\
&+\kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\Big(\Big(\frac{\partial \varepsilon_2}{\partial s} - \kappa_3\varepsilon_3 + \kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big) + \Big(\frac{\partial}{\partial s}\kappa_1(1 \\
&-\frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)
\end{aligned}
$$

※ *Quasi recursional normal electrical $\phi(\mathbf{b_q})$ viscoelastic microscale beam is*

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{RM}_{\phi(\mathbf{b_q})} = &\mathcal{V}_\varepsilon^{qn}\int\int_{\mathcal{F}} \Big(-\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\Big(\Big(\frac{\partial \varepsilon_2}{\partial s} \\
&-\kappa_3\varepsilon_3 + \kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big) + \Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 \\
&-\frac{m}{e}\kappa_2\Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(-\Big(\Big(\frac{\partial \varepsilon_2}{\partial s} \\
&-\kappa_3\varepsilon_3 + \kappa_1\varepsilon_1\Big)\chi + \frac{\partial \kappa_3}{\partial t}\Big)\kappa_1 - \Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\kappa_2\Big)d\sigma\Big)\mathbf{t}_q \\
&+\Big(\frac{\partial}{\partial s}\kappa_1(1 - \frac{m}{e}) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\Big(\chi\Big(\frac{\partial \varepsilon_3}{\partial s} + \varepsilon_2\kappa_3 + \kappa_2\varepsilon_1\Big) + \vartheta\kappa_3\Big)\Big)d\mathcal{F},
\end{aligned}
$$

where $\mathcal{V}_\varepsilon^{qn}$ is recursional quasi normal magnetic electric potential.

Since

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{ND}^*_{\phi(\mathbf{b_q})} = &-\Big(\int_\alpha \Big(\chi\big(\chi\kappa_2 + \kappa_3^2\big)\kappa_1 + \kappa_3\Big(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) \\
&+\kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big) \\
&-\chi\big(\chi\kappa_2 + \kappa_3^2\big)\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big) \\
&-\Big(\chi\Big(\frac{\partial \kappa_3}{\partial s} + \chi\kappa_1\Big) - \kappa_3\Big(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\Big)\Big)\Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big).
\end{aligned}
$$

※ *Quasi recursional ferromagnetic normal electrical $\phi(\mathbf{b_q})$ quasi microscale beam is*

$$
\begin{aligned}
{}^{\varepsilon}\mathcal{RM}^*_{\phi(\mathbf{b_q})} = &\mathcal{V}_\varepsilon^{qn}\int\int_{\mathcal{F}} \Big(-\Big(\chi\Big(\frac{\partial \kappa_3}{\partial s} + \chi\kappa_1\Big) - \kappa_3\Big(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\Big)\Big)\Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) \\
&-\kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big) - \Big(\int_\alpha \Big(\chi\big(\chi\kappa_2 + \kappa_3^2\big)\kappa_1 + \kappa_3\Big(\frac{\partial \chi}{\partial s} - \kappa_3\kappa_1\Big)\Big)\kappa_2\Big)d\sigma\Big)\Big(\int_\alpha \Big(\Big(\frac{\partial}{\partial s}(\chi \\
&-\frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\kappa_1 - \Big(\frac{\partial}{\partial s}\kappa_1\Big(1 - \frac{m}{e}\Big) - \kappa_1\frac{m}{e} - \kappa_3\Big(\chi - \frac{m}{e}\kappa_2\Big)\Big)\kappa_2\Big)d\sigma\Big) \\
&-\chi\big(\chi\kappa_2 + \kappa_3^2\big)\Big(\frac{\partial}{\partial s}\Big(\chi - \frac{m}{e}\kappa_2\Big) + \kappa_1\Big(1 - \frac{m}{e}\Big)\kappa_3 - \frac{m}{e}\kappa_2\Big)\Big)d\mathcal{F}.
\end{aligned}
$$

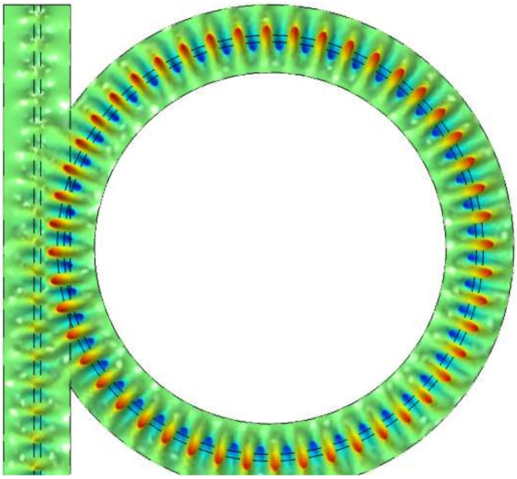

Fig. 3 Optical ferromagnetic normal recursional electric $\phi(\mathbf{b_q})$ microscale beam

Optical quasi model for ferromagnetic normal recursional electric $\phi(\mathbf{b_q})$ flexible elastic quasi normal $\mathbb{Q}\mathbf{n_q}$−microscale beam with optical ring quasi resonator is illustrated in Fig. 3.

3 Conclusion

The analysis of optical electromagnetic waves in hydrodynamics constructed a range of phenomena, including the refraction and dispersion of light in water, the effects of surface waves on optical wavefronts, and the impact of random variations in the medium on the coherence and polarization of optical signals with geometrical applications [53–63].

In our article, we establish optical ferromagnetic illustration for recursional electromagnetic flexible elastic microscale beams with quasi fields. We construct properties of quasi recursional normal electromagnetic flexible elastic quasi microscale beams in terms of quasi normalized operator. We give new characterizations for ferromagnetic electric normalized quasi optimistic density with quasi frame. Finally, we obtain optical application for recursional electrical flexible elastic quasi microscale beam with optical quasi resonator.

Author Contributions All authors of this research paper have directly participated in the planning, execution, or analysis of this study; All authors of this paper have read and approved the final version submitted.

Funding Open access funding provided by the Scientific and Technological Research Council of Türkiye (TÜBİTAK). No funding was received for the study.

Availability of data and materials No data was used for the research described in the article.

Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical approval The contents of this manuscript have not been copyrighted or published previously; The contents of this manuscript are not now under consideration for publication elsewhere.

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