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I_x I_z.

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I_z ,
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[2, 3] -

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[4, 5]

$$\vec{f}(x,z,t) = \left[\vec{\sigma}(x,z,t)\vec{B}(x,z,t)\right],\tag{1}$$

$\vec{\sigma}(x,z,t)$, $\vec{B}(x,z,t)$ – -

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(. 1)

$\sigma_x(x,z,t)$, $\sigma_z(x,z,t)$ $- B_y(x,z,t)$.

(1) i-

$$\vec{f}_i(x,z,t) = f_{ix}(x,z,t)\vec{i} + f_{iz}(x,z,t)\vec{k} =$$

$$= -\mu_{yi}\sigma_{iz}(x,z,t)H_{iy}(x,z,t)\vec{i} + \mu_{yi}\sigma_{ix}(x,z,t)H_{iy}(x,z,t)\vec{k},$$

(2)

$\vec{i}, \vec{k}$ –   .

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, $k\ (i, ..., i + k)$,   :

$$F_{kx}(t) = -\sum_{i}^{i+k} \mu_{yi} \int_{0}^{\delta_i} \int_{0}^{l} \sigma_{iz}(x,z',t)H_{iy}(x,z',t)dxdz';\qquad (\ )$$

(3)

$$F_{kz}(t) = \sum_{i}^{i+k} \mu_{yi} \int_{0}^{\delta_i} \int_{0}^{l} \sigma_{ix}(x,z',t)H_{iy}(x,z',t)dxdz',\qquad (\ )$$

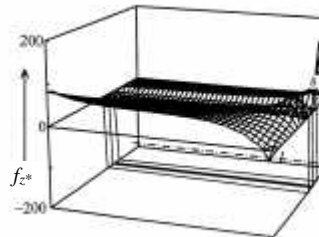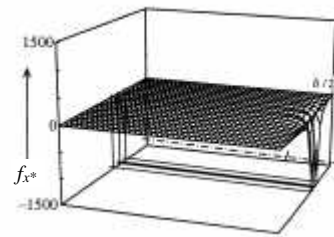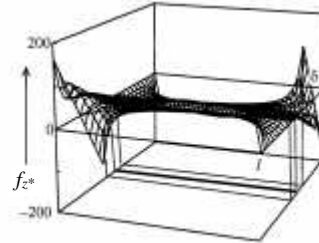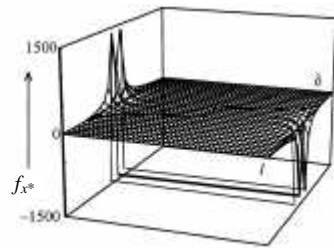$z' -$,   -

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. 2. $(f_x = f_{x*} \cdot 4\pi (J_m h)^2 \cdot 10^{-7} \quad / \quad ^2)$

$(f_z = f_{z*} \cdot 4\pi (J_m h)^2 \cdot 10^{-7} \quad / \quad ^2)$

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0,04   (. 3, 4),   -

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. F_z -

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F_x .

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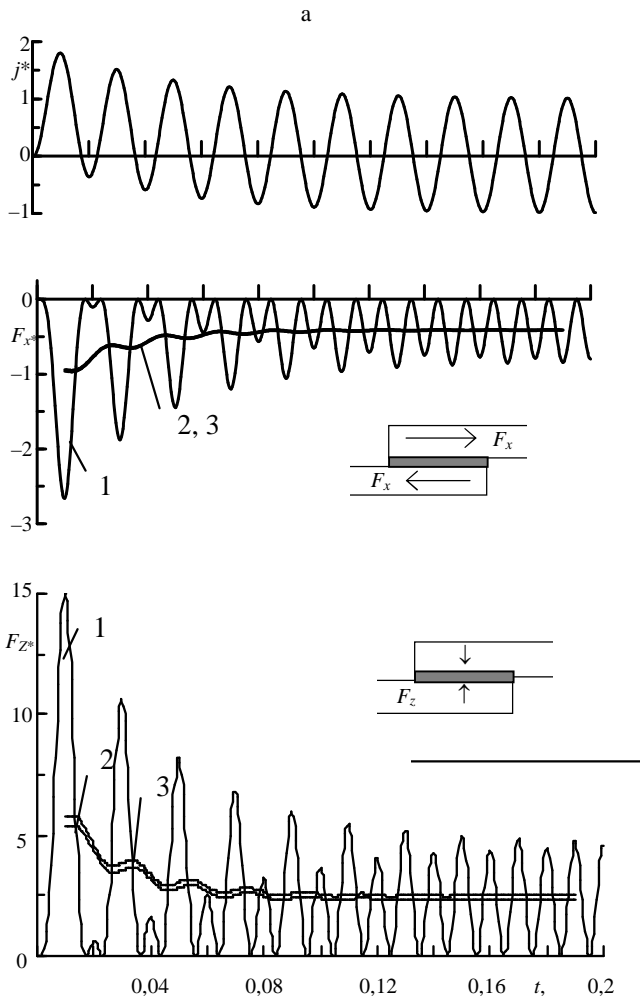
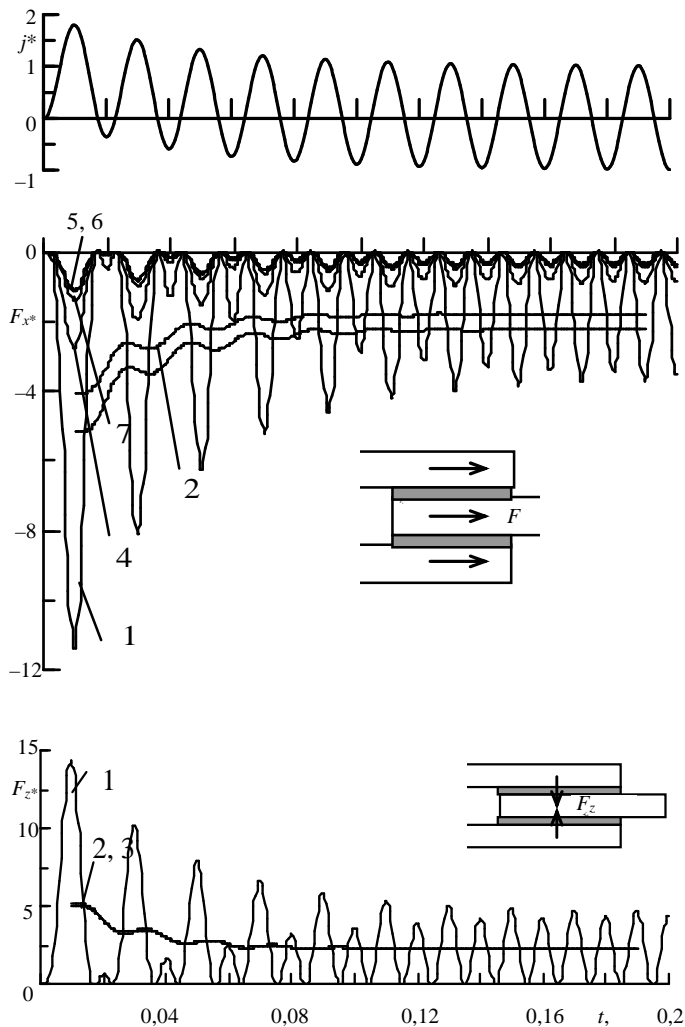$. 3.$ $j = j_* J_m \; / \quad (\;),$

$F_x = F_{x*} \cdot 4\pi (J_m h)^2 \cdot 10^{-10} \quad (\;)$ $F_z = F_{z*} \cdot 4\pi (J_m h)^2 \cdot 10^{-10} \quad (\;)$

$: 1 - \qquad\qquad\qquad ; 2 - \qquad\qquad ;$

$3 -$

F_x

F_z $(l = 0,02; \; 0,04; \; 0,08 \quad)$,

F_z

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F_x .   ,

[1...3],   -

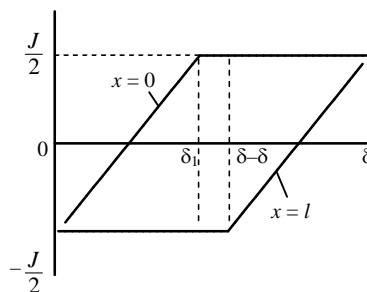.   -

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. 4.

$$F_x = F_{x*} \cdot 4\pi(J_m h)^2 \cdot 10^{-10} \quad (\ )$$

( )

$$j = j_* J_m \ / \ (\ ),$$

$$F_z = F_{z*} \cdot 4\pi(J_m h)^2 \cdot 10^{-10}$$

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    (. 5)

$$\sigma_x(t) = \frac{i(t)}{h\delta} = \frac{j(t)}{\delta}, \tag{4}$$

    $i(t)$ –   ; $j(t)$ –

        ; h –   .

                                                        -

            (. 5)

$$H_y(z,t) = H_y(0,t) - \frac{H_y(0,t) - H_y(\delta,t)}{\delta} z = \frac{j(t)}{2\delta}(\delta - 2z), \tag{5}$$

        $H_y(0,t) = -H_y(\delta,t)$

    $h \gg \delta$ $H_y(0,t) = \frac{i(t)}{2(h+\delta)} \approx \frac{j(t)}{2}$.

                                                        $z,$

. . $\sigma_z(0,z,t)$ $\sigma_z(l,z,t)$.   -

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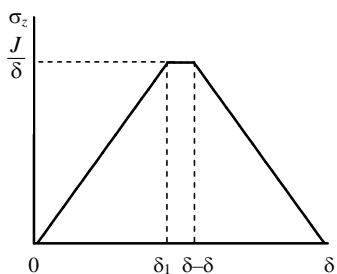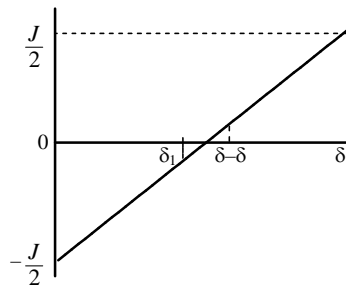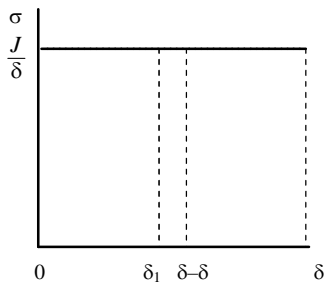
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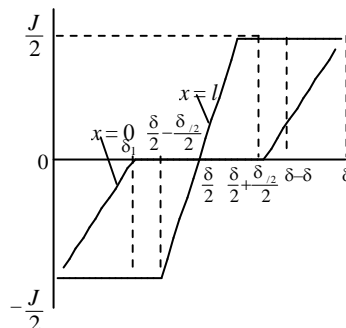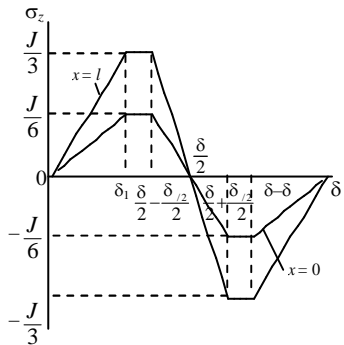
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$$\sigma_z(0,z,t) = \sigma_z(l,z,t) = \begin{cases} \dfrac{j(t)}{2\delta_1}\,z, & z \in [0,\delta_1]; \\[2mm] \dfrac{j(t)}{2}, & z \in [\delta_1,(\delta-\delta_n)]; \\[2mm] \dfrac{j(t)}{2\delta_n}(\delta-z), & z \in [(\delta-\delta_n),\delta]; \end{cases} \tag{6}$$

$$\sigma_z(0,z,t) = \begin{cases} \dfrac{j(t)(\delta - 2\delta_1)}{2\delta}\dfrac{z}{\delta_1}, & z \in [0, \delta_1]; \\[2ex] \dfrac{j(t)(\delta - 2\delta_1)}{2\delta}, & z \in [\delta_1, (\delta/2 - \delta_{n/2}/2)]; \\[2ex] \dfrac{j(t)(\delta - 2\delta_1)}{2\delta}\dfrac{2(\delta/2 - z)}{\delta_{n/2}}, & z \in [(\delta/2 - \delta_{n/2}/2), \delta/2]; \end{cases} \tag{7}$$

$$\sigma_z(l,z,t) = \begin{cases} \dfrac{j(t)(\delta - \delta_{n/2})}{2\delta}\dfrac{z}{\delta_1}, & z \in [0, \delta_1]; \\[2ex] \dfrac{j(t)(\delta - \delta_1)}{2\delta}, & z \in [\delta_1, (\delta/2 - \delta_{n/2}/2)]; \\[2ex] \dfrac{j(t)(\delta - \delta_{n/2})}{2\delta}\dfrac{2(\delta/2 - z)}{\delta_{n/2}}, & z \in [(\delta/2 - \delta_{n/2}/2), \delta/2]. \end{cases}$$

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$$H_y(0,z,t) = \begin{cases} j(t)\left(\dfrac{z}{\delta_1} - \dfrac{1}{2}\right), & z \in [0, \delta_1]; \\[2ex] \dfrac{j(t)}{2}, & z \in [\delta_1, \delta]; \end{cases}$$
$$\tag{8}$$
$$H_y(l,z,t) = \begin{cases} -\dfrac{j(t)}{2}, & z \in [0, (\delta - \delta_n)]; \\[2ex] j(t)\left(\dfrac{1}{2} - \dfrac{\delta - z}{\delta_n}\right), & z \in [(\delta - \delta_n), \delta], \end{cases}$$

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$$H_y(0,z,t) = \begin{cases} j(t)\left(\dfrac{z}{2\delta_1} - \dfrac{1}{2}\right), & z \in [0, \delta_1]; \\[2ex] 0, & z \in [\delta_1, \delta/2]; \end{cases}$$
$$\tag{9}$$
$$H_y(l,z,t) = \begin{cases} -\dfrac{j(t)}{2}, & z \in [0, (\delta/2 - \delta_{n/2}/2)]; \\[2ex] j(t)\left(\dfrac{z - \delta/2 + \delta_{n/2}/2}{\delta_{n/2}} - \dfrac{1}{2}\right), & z \in [(\delta/2 - \delta_{n/2}/2), \delta/2]. \end{cases}$$

(4)…(9)   ,   -

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$$F_z(t) = 0{,}125\mu_y j^2(t)l; \tag{10}$$

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$$\left|F_{xi}(t)\right| = \begin{cases} 0{,}0833\mu_{yi} j^2(t)\delta_i, & i = 1,\,6; \\ 0, & i = 2,\,3,\,4,\,5; \end{cases} \tag{11}$$

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$$\left|F_{xi}(t)\right| = \begin{cases} 0{,}0972\mu_{yi} j^2(t)\delta_i, & i = 1,\,11; \\ 0{,}1667\mu_{yi} j^2(t)\delta_i, & i = 2,\,5,\,7,\,10; \\ 0{,}0833\mu_{yi} j^2(t)\delta_i, & i = 6. \end{cases} \tag{12}$$

(10) , F_z

, F_x,

(11), (12), , -

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F_z 10…20 %, F_x – 20…25 %.

5…15 %.

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		,	F_{*_z}	F_{*_x}
	$\delta = 22$	- ,	0,02	$\dfrac{8,10}{7,06}$	$\dfrac{2,70}{2,65}$
			0,04	$\dfrac{16,20}{15,04}$	$\dfrac{2,70}{2,65}$
			0,08	$\dfrac{32,40}{31,19}$	$\dfrac{2,70}{2,57}$
	$\delta = 33$	- ,	0,02	$\dfrac{8,10}{6,92}$	$\dfrac{14,41}{11,55}$
			0,04	$\dfrac{16,20}{14,35}$	$\dfrac{14,41}{11,41}$
			0,08	$\dfrac{32,40}{29,45}$	$\dfrac{14,41}{12,20}$
	- , $\delta = 22$		0,04	$\dfrac{16,20}{13,81}$	$\dfrac{2,70}{2,79}$
	- , $\delta = 33$		0,04	$\dfrac{16,20}{13,38}$	$\dfrac{11,17}{8,78}$

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