[illegible] 517.927

[illegible]

[illegible]

[illegible]

[illegible] [1-3] [illegible] [4], [illegible]

[illegible]

$$\frac{dx}{dt} = f(t, x), \qquad (1)$$

[illegible]

$$\alpha x(0) + \beta x(T) = \gamma. \qquad (2)$$

[illegible] x - [illegible] $C_{R_m}[0;T]$ [illegible] m-[illegible] $t \in [0;T]$; $a, b \in C_{R_m}[0;T]$, $f : D = [0;T] \times [a;b] \to C_{R_m}[0;T]$; γ - m-[illegible] α [illegible] β - [illegible] $m \times m$.

[illegible] $\alpha + \beta$ – [illegible] $(\alpha + \beta)^{-1}\alpha \ge \theta$, $(\alpha + \beta)^{-1}\beta \ge \theta$, [illegible] (1), (2) [illegible]

$$\Lambda[\varphi(t); \psi(t)] = (\alpha + \beta)^{-1}\alpha \int_0^t \varphi(s)ds + (\alpha + \beta)^{-1}\beta \int_T^t \psi(s)ds.$$

[illegible]: 1) [illegible] $f(t, x)$ [illegible]; 2) [illegible] $G(t, y, z) = \{g_{ij}(t, y, z)\}$, $\alpha(t, y, z) = \{\alpha_{ij}(t, y, z)\}$, $A(t, y, z) = \{a_{ij}(t, y, z)\}$, ($i, j = \overline{1, m}$) [illegible] y [illegible] z [illegible] $y, z \in [a, b]$, $t \in [0, T]$ [illegible] $y \le z$ ($t \in [0, T]$, $x, y, z \in [a, b]$) [illegible]

$$(G(t, y, z) + \alpha(t, y, z) - A(t, z, y))(z - y) \le f(t, z) - f(t, y);$$

3) [illegible]

$$p \ge \Lambda[G(t, y, z)p; -(G(t, y, z) + \alpha(t, y, z))p],$$

$$p \ge \Lambda[(G(t, y, z) + \alpha(t, y, z))p; -G(t, y, z)p]$$

[illegible] $y \le z$, $t \in [0;T]$, $y, z \in [a;b]$ [illegible] $p \ge \theta$.

[illegible] 1. [illegible] 1)-3) **[illegible]**

$$
\begin{cases}
y_{n+1} = \Lambda\left[G(t,y_n,z_n)(y_{n+1}-y_n) + A(t,z_n,y_n)(y_n-z_n) +\right.\\
+ f(t,y_n); (G(t,y_n,z_n)+\alpha(t,y_n,z_n))(z_{n+1}-z_n) +\\
\left.+ A(t,z_n,y_n)(z_n-y_n) + f(t,z_n)\right] + (\alpha+\beta)^{-1}\gamma;\\
z_{n+1} = \Lambda\left[(G(t,y_n,z_n)+\alpha(t,y_n,z_n))(z_{n+1}-z_n) +\right.\\
A(t,z_n,y_n)(z_n-y_n) + f(t,z_n); G(t,y_n,z_n)(y_{n+1}-y_n) +\\
\left.+ A(t,z_n,y_n)(y_n-z_n) + f(t,y_n)\right] + (\alpha+\beta)^{-1}\gamma;
\end{cases}
\tag{3}
$$

tʃtɑʃ ʢtsɣ ʤtsʤʒƶ $n = 0,1,2,\ldots,\ y_0 = a,\quad z_0 = b,$ ***ʤʒʘ ʿʜʠʤʠʡ tɑtsʟɘôʷʟtsʢ. ʊtsʜʿ ʟ tʃtɑʃtʃƶʰ ʝʤƶ tʃtɑts ʿfɱƶɘʘʤƶ tɑtsʟɘôʷʟʢƶ*** $x^{*} \in [a;b]$ ***ʟʘʜʘʯʿ*** (1), (2) ***lsʘʤʝ tɕʿɘʤsfɱsʝʡ***

$$
y_0 \le y_1 \le x^* \le z_1 \le z_0
$$

ɘʠtʃʤʠʃɘʘ lsɹ fɱʃʿɘɘʿʜʤsʰ ʝʤƶ

$$
y_n \le y_{n+1} \le x^* \le z_{n+1} \le z_n . \tag{4}
$$

ɼ tsɘʝ ʜʝ ʤƶʤƶ. ʃ fɱʢʿʤƶ ʢʠ $\Lambda[\varphi(t),\psi(t)] = L^{+}[\varphi(t)] - L^{-}[\psi(t)]$, ʜʝ

$L^{+}[\varphi(t)] = (\alpha+\beta)^{-1}\alpha\int_0^t \varphi(s)ds$, $\quad L^{-}[\psi(t)] = -(\alpha+\beta)^{-1}\beta\int_T^t \psi(s)ds\quad$ ʤƶʤƶʡ ʤƶ ʜtsʜʘlsʤƶ tstʃʝ tɑʘlststɑʃ.

ɟ tsʟʤʘʯʠɘʰ ʠ

$$
F_1(t,u,v,y,z) = G(t,y,z)(u-y) + A(t,z,y)(y-z) + f(t,y),
$$
$$
F_2(t,u,v,y,z) = (G(t,y,z)+\alpha(t,y,z))(v-z) +
$$
$$
+ A(t,z,y)(z-y) + f(t,z),
$$

tʃtɑʃ $\quad \underline{y} \le \underline{u} \le \underline{v} \le \underline{z},\ \underline{y} \le \bar{y} \le \bar{z} \le \underline{z}\quad$ tslstɑʃʤʒʘ ʤʒs

$$
\begin{aligned}
&F_1(t,\bar{u},\bar{v},\bar{y},\bar{z}) - F_1(t,\underline{u},\underline{v},\underline{y},\underline{z}) = G(t,\bar{y},\bar{z})(\bar{u}-\bar{y}) + A(t,\bar{z},\bar{y})(\bar{y}-\bar{z}) +\\
&+ f(t,\bar{y}) - G(t,\underline{y},\underline{z})(\underline{u}-\underline{y}) - A(t,\underline{z},\underline{y})(\underline{y}-\underline{z}) - f(t,\underline{y}) \ge G(t,\bar{y},\bar{z})\times\\
&\times(\bar{u}-\bar{y}) - G(t,\underline{y},\underline{z})(\underline{u}-\underline{y}) + A(t,\bar{z},\bar{y})(\bar{y}-\bar{z}) - A(t,\underline{z},\underline{y})(\underline{y}-\underline{z}) +\\
&+ (G(t,\underline{y},\bar{y}) + \alpha(t,\underline{y},\bar{y}) - A(t,\bar{y},\underline{y}))(\bar{y}-\underline{y}) \ge G(t,\bar{y},\bar{z})(\bar{u}-\underline{u}) +\\
&+ (G(t,\underline{y},\bar{y}) - G(t,\underline{y},\underline{z}))(\bar{y}-\underline{y}) + \alpha(t,\underline{y},\bar{y})(\bar{y}-\underline{y}) + A(t,\underline{z},\underline{y})(\underline{z}-\bar{z}) \ge\\
&\ge G(t,\bar{y},\bar{z})(\bar{u}-\underline{u})
\end{aligned}
$$

lsʘ

$$
\begin{aligned}
&F_2(t,\underline{u},\underline{v},\underline{y},\underline{z}) - F_2(t,\bar{u},\bar{v},\bar{y},\bar{z}) = (G(t,\underline{y},\underline{z}) + \alpha(t,\underline{y},\underline{z}))(\underline{v}-\underline{z}) +\\
&+ A(t,\underline{z},\underline{y})(\underline{z}-\underline{y}) + f(t,\underline{z}) - (G(t,\bar{y},\bar{z}) + \alpha(t,\bar{y},\bar{z}))(\bar{v}-\bar{z}) - A(t,\bar{z},\bar{y})\times\\
&\times(\bar{z}-\bar{y}) - f(t,\bar{z}) \ge (G(t,\underline{y},\underline{z}) + \alpha(t,\underline{y},\underline{z}))(\underline{v}-\underline{z}) - (G(t,\bar{y},\bar{z}) +\\
&+ \alpha(t,\bar{y},\bar{z}))(\bar{v}-\bar{z}) + A(t,\underline{z},\underline{y})(\underline{z}-\underline{y}) - A(t,\bar{z},\bar{y})(\bar{z}-\bar{y}) + (G(t,\bar{z},\underline{z}) +\\
&+ \alpha(t,\bar{z},\underline{z}) - A(t,\underline{z},\bar{z}))(\underline{z}-\bar{z}) \ge (G(t,\bar{y},\bar{z}) + \alpha(t,\bar{y},\bar{z}))(\underline{v}-\bar{v}) +\\
&+ (G(t,\bar{z},\underline{z}) - G(t,\underline{y},\underline{z}))(\underline{z}-\bar{z}) + (\alpha(t,\bar{z},\underline{z}) - \alpha(t,\underline{y},\underline{z}))(\underline{z}-\bar{z})\\
&+ \alpha(t,\bar{z},\underline{z})(\underline{z}-\bar{z}) + A(t,\underline{z},\underline{y})(\bar{y}-\underline{y}) \ge (G(t,\bar{y},\bar{z}) + \alpha(t,\bar{y},\bar{z}))(\underline{v}-\bar{v}).
\end{aligned}
$$

ʊtsʜʿ ʜtsɘʝ ʜʝ ʤƶʤƶ lsʝ tstɑʝ ʤʒʠ ʤʒtsɣ ʤʘʟʘɘʝ tɕʰ ʠlsʠ tʃtsʢ ʤʠʢʘʤƶʤƶ ʤʒ ʤʘlsʝ tstɑʝ ʤʒƶ 33.4 ʿʟ [3] (ʜʠɘ. [3] fɱs. 450).

ɩ ʝʭʘʡ 4) ʟʘʜʘʤƶ ʤʒʘlstɑʃʯ $\beta(t,y,z) = \{\beta_{ij}(t,y,z)\},\ (i,j=\overline{1,m})$ ʤʝ tʃʝ tɑʝ tɑɘʤʠʭ ʟʘ fɱƶʢƶtʃ ʤƶfɱs

ʘtɑɢƶʤʒʝ ʤsʿɘ ʤʝ ʟtɑtsfɱsʘ ʯʠʭ ʟʘ y ʿ ʤʝ fɱʃʘʜʤʠʭ ʟʘ z ʜtsʜʘlsʤʠʭ tʃtɑʃ $y,z \in [a,b],\ t \in [0,T]$ ʜʿʡ fɱʤʠʭ

ʷʷ ƶʤʢʯʿʡ, ʜʤƶ ʷʢtsʾ ʿʟ fɱʃʿɘɘʿʜʤsʰ ʝʤƶ $y \le z$ $t \in [0,T],\ x,y,z \in [a,b]$ ɘʠtʃʤʠɘʘ ls ʤʝ tɕʿɘʤsfɱsʿ

$$
f(t,z) - f(t,y) \le (G(t,y,z) + \beta(t,y,z) - A(t,z,y))(z-y),
$$

[illegible] $G(t,y,z)$, $A(t,y,z)$ [illegible] 3).

[illegible] D [illegible] 1)-5), [illegible] $z_{n+1}-y_{n+1}$ [illegible] 5) [illegible]

$$
\begin{aligned}
&z_{n+1}-y_{n+1}=\Lambda\left[\left(G(t,y_n,z_n)+\alpha(t,y_n,z_n)\right)(z_{n+1}-z_n);G(t,y_n,z_n)\times\right.\\
&\left.\times(y_{n+1}-y_n)\right]+\Lambda\left[A(t,z_n,y_n)(z_n-y_n);A(t,z_n,y_n)(y_n-z_n)\right]+\\
&+\Lambda\left[f(t,z_n);f(t,y_n)\right]-\Lambda\left[f(t,y_n);f(t,z_n)\right]-\Lambda\left[G(t,y_n,z_n)\times\right.\\
&\left.\times(y_{n+1}-y_n);\left(G(t,y_n,z_n)+\alpha(t,y_n,z_n)\right)(z_{n+1}-z_n)\right]-\Lambda\left[A(t,z_n,y_n)\times\right.\\
&\left.\times(y_n-z_n);A(t,z_n,y_n)(z_n-y_n)\right]\le\Lambda\left[G(t,y_n,z_n)(z_{n+1}-y_{n+1});G(t,y_n,z_n)\times\right.\\
&\left.\times(y_{n+1}-z_{n+1})\right]-\Lambda\left[G(t,y_n,z_n)(z_n-y_n);G(t,y_n,z_n)(y_n-z_n)\right]+\\
&+\Lambda\left[\alpha(t,y_n,z_n)(z_{n+1}-z_n);\alpha(t,y_n,z_n)(z_{n+1}-z_n)\right]+2\Lambda\left[A(t,z_n,y_n)\times\right.\\
&\left.\times(z_n-y_n);A(t,z_n,y_n)(y_n-z_n)\right]+\Lambda\left[\left(G(t,y_n,z_n)+\beta(t,y_n,z_n)-\right.\right.\\
&\left.\left.-A(t,z_n,y_n)\right)(z_n-y_n)\left(G(t,y_n,z_n)+\beta(t,y_n,z_n)-A(t,z_n,y_n)\right)(y_n-z_n)\right]\le\\
&\le\Lambda\left[\left(A(t,z_n,y_n)+\beta(t,y_n,z_n)\right)(z_n-y_n);\left(A(t,z_n,y_n)+\beta(t,y_n,z_n)\right)\times\right.\\
&\left.\times(y_n-z_n)\right]+\Lambda\left[G(t,y_n,z_n)(z_{n+1}-y_{n+1});G(t,y_n,z_n)(y_{n+1}-z_{n+1})\right].
\end{aligned}
$$

[illegible] $G=\{g_{ij}\}$, $A=\{a_{ij}\}$, $B=\{b_{ij}\}$ [illegible]

$$g_{ij}=\max_{\substack{t\in[0,T]\\ y,z\in[a,b]}}\left|g_{ij}(t,y,z)\right|,$$

$$a_{ij}=\max_{\substack{t\in[0,T]\\ y,z\in[a,b]}}\left|a_{ij}(t,y,z)\right|,$$

$$b_{ij}=\max_{\substack{t\in[0,T]\\ y,z\in[a,b]}}\left|\beta_{ij}(t,y,z)\right|.$$

[illegible] $(E-GT)^{-1}\ge\Theta$ [illegible]

$$\left\|z_{n+1}-y_{n+1}\right\|\le\left\|(E-GT)^{-1}T(A+B)\right\|\cdot\left\|z_n-y_n\right\|. \qquad (5)$$

[illegible] 2. ***[illegible]*** D ***[illegible]*** 1)-4)***;*** ***[illegible]*** (3) ***[illegible]*** $n=0,1,2,\ldots$, $x_0=a$, $z_0=b$ ***[illegible]*** $y_0\le y_1\le z_1\le z_0$***; [illegible]*** $(E-GT)^{-1}$ ***[illegible]*** $\|Q\|\le q<1$, ***[illegible]*** $Q=(E-GT)^{-1}T(A+B)$. ***[illegible]*** $[a,b]$ ***[illegible]*** x^* ***[illegible]*** (1), (2), ***[illegible]*** $t\in[0;T]$ ***[illegible]*** $\{y_n\}$, $\{z_n\}$ ***[illegible]*** (3), ***[illegible]*** (4).

[illegible]. [illegible] $G(t,y,z)w$, $\alpha(t,y,z)w$, $A_k(t,y,z)w$, $\beta(t,y,z)w$, [illegible] 1 [illegible] $y^*=\lim_{n\to\infty}y_n$, $z^*=\lim_{n\to\infty}z_n$. [illegible],

$$
\begin{aligned}
&y^*=\Lambda\left[G(t,y^*,z^*)(y^*-y^*);\left(G(t,y^*,z^*)+\alpha(t,y^*,z^*)\right)(z^*-z^*)\right]+\\
&+\Lambda\left[A(t,z^*,y^*)(y^*-z^*);A(t,z^*,y^*)(z^*-y^*)\right]+\Lambda\left[f(t,y^*);f(t,z^*)\right]+\\
&+(\alpha+\beta)^{-1}\gamma=\Lambda\left[A(t,z^*,y^*)(y^*-z^*);A(t,z^*,y^*)(z^*-y^*)\right]+\\
&+\Lambda\left[f(t,y^*);f(t,z^*)\right]+(\alpha+\beta)^{-1}\gamma.\\
&z^*=\Lambda\left[A(t,z^*,y^*)(z^*-y^*);A(t,z^*,y^*)(y^*-z^*)\right]+\\
&+\Lambda\left[f(t,z^*);f(t,y^*)\right]+(\alpha+\beta)^{-1}\gamma
\end{aligned}
$$

[illegible] (5) [illegible] $\|z_{n+1}-y_{n+1}\|\le q\|z_n-y_n\|$, [illegible] $\|z_{n+1}-y_{n+1}\|\le q^{n+1}\|z_0-y_0\|$, [illegible] (4), [illegible] $\lim_{n\to\infty}z_n=\lim_{n\to\infty}y_n$, [illegible], $y^*=z^*=x^*$.

[illegible]

$$x^* = (\alpha+\beta)^{-1}\gamma - (\alpha+\beta)^{-1}\alpha\int_0^t f(s,x^*)ds + (\alpha+\beta)^{-1}\beta\int_T^t f(s,x^*)ds$$

[illegible], x^* – [illegible] (1), (2). [illegible]

[illegible]. [illegible] $\alpha_{ij}(t,y,z)$ [illegible] $\beta_{ij}(t,y,z)$ $(i,j=\overline{1,m}, t\in[0;T])$ [illegible]

$$\alpha_{ij}(t,y,z) \le a_{ij}^{(0)}(z-y),$$

$$\beta_{ij}(t,y,z) \le b_{ij}^{(0)}(z-y)$$

[illegible] $\|Q_0\| \le q_0 < 1$, [illegible] $Q_0 = (E-GT)^{-1}(A_0+B_0)T$, $A_0 = \{a_{ij}^{(0)}\}$, $B_0 = \{b_{ij}^{(0)}\}$, [illegible] (3) [illegible] (5) [illegible]

$$\|z_{n+1} - y_{n+1}\| \le \left\|(E-GT)^{-1}(A_0+B_0)T\right\| \|z_n - y_n\|^2 \le q_0\|z_n - y_n\|^2.$$

[illegible] (5), [illegible]

1. [illegible] – 1980. – 268 [illegible]
2. [illegible] // [illegible] 1. – [illegible] 1981. – [illegible] 68–73.
3. [illegible] 2007. – 516 [illegible]
4. [illegible] 1992. – 277 [illegible]