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Operator Differential Equations in Frechet space

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The report is devoted to obtaining necessary and sufficient conditions for existence of generalized solutions of boundary value problem

$$\dot{x}(t) = A(t)x(t) + f(t), \tag{1}$$

$$lx(\cdot) = \alpha, \tag{2}$$

in Frechet space $(F, \|\cdot\|_n)_{n\in\mathbb{N}}$. Unbounded operator-function $A(t)$ with dense in F domain D is infinitisemal operator of evolution semigroup $\{U(t,\tau)|\ t,\tau \in \mathbb{R}\}$, extended by continuity on space F. Operator-functional l is bounded and maps vector-function $x(t)$ into another Frechet space F_1, $\alpha \in D$.

Condition of solvability of (1), (2) is given. Generalized solutions of (1), (2) built with using generalized-inverse operators [1] and generalized Greens operator [2,3].

[1] Boichuk A.A., Samoilenko A.M., *Generalized inverse operators and Fredholm boundary value problems*, VSP, Utrecht-Boston, 2004.

[2] Pokutnyi O. O., *Journal of numerical and applied mathematics* **98**, 2 (2009), p. 35–40.

[3] Pokutnyi O. O., *Differential equations* **48**, 6 (2012), p. 803–813.