

# To the theory of linear ordinary differential equations of fractional order with constant coefficients

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**Abstract:** Consider the equation

$$\sum_{k=1}^m \lambda_k \frac{d^{\sigma_k}}{dx^{\sigma_k}} u(x) = f(x),$$

where  $d^{\sigma_k}/dx^{\sigma_k}$  is a fractional derivative of order  $\sigma_k$  ( $\sigma_k \geq 0$ ),  $\lambda_k \in \mathbb{R}$ . The fractional differentiation is given by the Dzhrbashyan-Nersesyan operator [1], associated with the sequence  $\{\gamma_0^k, \gamma_1^k, \dots, \gamma_{n(k)}^k\}$ .

In the work we discuss the questions concerning the construction of the fundamental solution, the representation of the general solution and the correct form of initial conditions for the equation under consideration.

**Keywords:** fractional derivative, Dzhrbashyan-Nersesyan operator, fractional order differential equation

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## REFERENCES

- [1] Dzhrbashyan, M.M., Nersesyan, A.B., "Fractional derivatives and the Cauchy problem for differential equations of fractional order", *Izv. Akad. Nauk Armenian SSR Matem.*, Vol. 3, No. 1, pp. 3-28, 1968. (Russian)