Cherskii, Yu. I.** On the integro-differential equation of Wiener-Hopf and its applications. *Izv. vyssh. ucheb. zavedenii. Matematika*, 1965, No. 2, pp. 188-200.

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Abstract

Full Text

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(To be continued in the next issue)

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CORRECTIONS FOR THE JOURNAL "DIFFERENTIAL EQUATIONS" FOR 1965

Journal No.	Page	Line or formula	Printed	Should read
8	1042	formula (0.2)	$t\int_0^t A(t,\lambda)\,dt$	$\exp\left(\int_0^t A(t,\lambda)\,dt\right)$
»	1045	formula (2.5)	$\sqrt{(1-a(\lambda)^2-a^2(\lambda)}$	$\sqrt{(1-a(\lambda))^2-a^2(\lambda)}$
»	1048	13 from bottom	we obtain	we obtain the required result.
»	1048	9 from bottom	$\lambda(n(k))$	$\gamma(n(k))$
»	1048	14 from bottom	$\sum_{k=1}^{\infty}\left\|\int_0^t\right\| f_k(t)\,dt\,\lambda^k$	$\sum_{k=1}^{\infty}\left\|\int_0^t f_k(t)\,dt\,\lambda^k\right\|$
»	1049	2 from bottom	$\|\omega_1\| < 1$	$\|\omega_1\| \geq 1$
»	1050	15 from top	(k^r+1)	$(2k^r+1)$

Journal No.	Page	Line or formula	Printed	Should read
»		Formulas (4.5) and (5.3) are valid for $\lvert m_1\rvert + \cdots + \lvert m_{n(k)}\rvert < N(k)$		
11	1499	1 from bottom	$x^{n-1}(t)$	$x^{(\beta n-1)}(t)$

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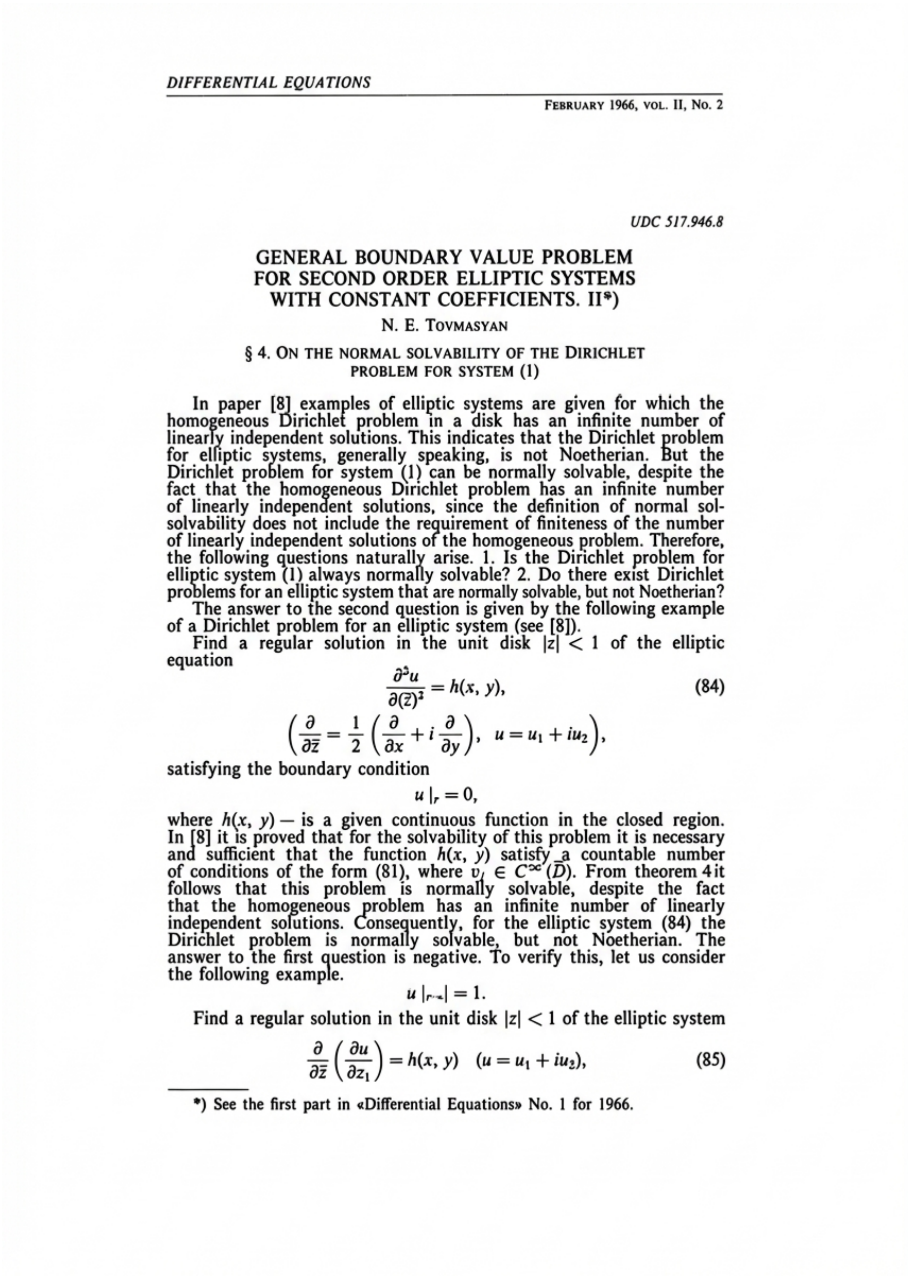

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GENERAL BOUNDARY VALUE PROBLEM FOR SECOND ORDER ELLIPTIC SYSTEMS WITH CONSTANT COEFFICIENTS. II*)

N. E. TOVMASYAN

§ 4. ON THE NORMAL SOLVABILITY OF THE DIRICHLET PROBLEM FOR SYSTEM (1)

In paper [8] examples of elliptic systems are given for which the homogeneous Dirichlet problem in a disk has an infinite number of linearly independent solutions. This indicates that the Dirichlet problem for elliptic systems, generally speaking, is not Noetherian. But the Dirichlet problem for system (1) can be normally solvable, despite the fact that the homogeneous Dirichlet problem has an infinite number of linearly independent solutions, since the definition of normal sol-solvability does not include the requirement of finiteness of the number of linearly independent solutions of the homogeneous problem. Therefore, the following questions naturally arise. 1. Is the Dirichlet problem for elliptic system (1) always normally solvable? 2. Do there exist Dirichlet problems for an elliptic system that are normally solvable, but not Noetherian?

The answer to the second question is given by the following example of a Dirichlet problem for an elliptic system (see [8]).

Find a regular solution in the unit disk $|z| < 1$ of the elliptic equation

$$\frac{\partial^2 u}{\partial(\bar{z})^2} = h(x, y), \tag{84}$$

$$\left(\frac{\partial}{\partial \bar{z}} = \frac{1}{2}\left(\frac{\partial}{\partial x} + i\frac{\partial}{\partial y}\right), \quad u = u_1 + iu_2\right),$$

satisfying the boundary condition

$$u|_r = 0,$$

where $h(x, y)$ — is a given continuous function in the closed region. In [8] it is proved that for the solvability of this problem it is necessary and sufficient that the function $h(x, y)$ satisfy a countable number of conditions of the form (81), where $v_l \in C^\infty(\bar{D})$. From theorem 4 it follows that this problem is normally solvable, despite the fact that the homogeneous problem has an infinite number of linearly independent solutions. Consequently, for the elliptic system (84) the Dirichlet problem is normally solvable, but not Noetherian. The answer to the first question is negative. To verify this, let us consider the following example.

$$u|_{r\to\infty}| = 1.$$

Find a regular solution in the unit disk $|z| < 1$ of the elliptic system

$$\frac{\partial}{\partial \bar{z}}\left(\frac{\partial u}{\partial z_1}\right) = h(x, y) \quad (u = u_1 + iu_2), \tag{85}$$

*) See the first part in «Differential Equations» No. 1 for 1966.

Figure 1: Figure 1