Golovach, G. P.
Solution of multiple generalized integral equations of Schlömilch's type. (Ukrainian)
Zbl 0924.45007
Visn., Ser. Fiz.-Mat. Nauky, Kyïv. Univ. Im. Tarasa Shevchenka 1997, No. 3, 16-18 (1997).

The author solves the integral equation

$$\left(\frac{2}{\pi}\right)^n \int_0^{+\infty} \dots \int_0^{+\infty} \phi(x_1 \cosh^{\alpha_1}\theta_1, x_2 \cosh^{\alpha_2}\theta_2, \dots, x_n \cosh^{\alpha_n}\theta_n) d\theta_1 \dots d\theta_n = f(x_1, \dots, x_n),$$

$\alpha_i > 0$, $x_i > 0$, $i = 1, \dots, n$, where f, ϕ are continuous functions; f is a known function; ϕ is an unknown function. The solution of the given integral equation has the form

$$\phi(s_1, \dots, \phi_n) = (-1)^n \prod_{i=1}^n s_i^{1-1/\alpha_i} \frac{\partial^n}{\partial s_1 \dots \partial s_n} \int_{s_1}^{+\infty} \dots \int_{s_n}^{+\infty} Af dx_1 \dots dx_n,$$

where

$$A = \prod_{i=1}^n x_i^{2/\alpha_i - 1} / \prod_{i=1}^n (x_i^{2/\alpha_i} - s_i^{2/\alpha_i})^{1/2}, x_i > s_i.$$

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MSC:

45E10 Integral equations of the convolution type (Abel, Picard, Toeplitz and Wiener-Hopf type)

Keywords:

multiple generalized integral equations; Schlömilch's type; closed form solution

