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THE RIEMANN-HILBERT PROBLEM IN THE CLASS OF WEIGHTED CAUCHY-TYPE INTEGRALS WITH DENSITY IN $L^{P(\cdot)}(\Gamma)$

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Let D be finite domain bounded by simple piecewise Lyapunov curve and $a(t)$, $b(t)$ are piecewise Holder continuous functions defined on Γ, ($\Gamma = \{t : t = t(s), 0 \le s \le l\}$, with an arc-lengths s).

We study the Riemann-Hilbert problem

$$\operatorname{Re}\left[(a(t) + ib(t))\Phi(t)\right] = c(t),\ t \in \Gamma, \qquad (1)$$

in the class of analytic in D functions $\Phi(z)$ represented by the formula

$$\Phi(z) \equiv \frac{\omega^{-1}(z)}{2\pi i} \int_{\Gamma} \frac{\varphi(t)dt}{t - z},\ z \in D, \qquad (2)$$

where $\varphi \in L^{P(\cdot)}(\Gamma)$, (that is - $\int_0^l |\varphi(t(s))|^{p(t(s))} ds < \infty$), $\omega(z) = \prod_{k=1}^{n} (z - t_k)^{\alpha_k}$, $t_k \in \Gamma$, $\alpha_k \in R$.

We suppose that $p(t)$ is Log-Holder continuous on Γ and $\min p(t) > 1$.

The conditions solvability of problem (1) and the explicit formulas for its solutions are given.