

## The problem of integral geometry of Volterra type

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*We study a new problem of reconstruction of a function in a strip from their given integrals with known weight function along polygonal lines. We obtain two simple inversion formulas for the solution to the problem. We prove uniqueness and existence theorems for solutions and obtain stability estimates of a solution to the problem in Sobolev spaces and thus show their weak ill-posedness. Then we consider integral geometry problems with perturbation. The uniqueness theorems are proved and stability estimates of solutions in Sobolev spaces are obtained. The given results are continuation of our research [1-5].*

- [1] Akram Kh. Begmatov, *Weakly ill-posed Volterra-type problems of integral geometry*, Doklady Mathematics **54:1** (1996), 536-537.
- [2] Akram Kh. Begmatov, *Problems of integral geometry for special curves and surfaces with singularities in vertices*, Doklady Mathematics **57:1** (1998), 117-118.
- [3] Akram Kh. Begmatov, *Two new classes of problems in integral geometry*, Doklady Mathematics **57:3** (1998), 427-429.
- [4] Akram Kh. Begmatov, Z. Kh. Ochilov, *Integral geometry problem with a discontinuous weight function*, Doklady Mathematics **80:3** (2009), 823-825.
- [5] Akram. H. Begmatov, M. E. Muminov, Z. KH. Ochilov, *The problem of integral geometry of Volterra type with a weight function of a special type*, Journal Mathematics and Statistics **3(5)** (2015), 113-120.

## Dirichlet type boundary value problems in polydiscs

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In this presentation, we consider the Riquier problem for polyharmonic equations defined in the unit polydisc of  $\mathbb{C}^n$ . This is a Dirichlet type boundary value problem for higher order linear complex differential equations with a polyharmonic leading term. After deriving a Green's function, we present the solution for a model equation with homogeneous boundary conditions. Afterwards we have converted the differential equation into a singular integral equation and employed Fredholm theory to obtain the solution of the linear equation for Riquier boundary value problem on a unit polydisc in  $\mathbb{C}^2$ .

## Some applications of the theory of conjugate differential forms

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