1116-35-2466 **Yuri Antipov**, Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803, and **Ashar Ghulam*** (aghula2@lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803. *Boundary value problem for the Helmholtz equation in a semi-infinite strip and the Riemann-Hilbert problem.*

The Helmholtz equation in a semi-infinite strip subject to the boundary conditions $[U_j(\partial_\tau)\partial_n + \mu_j]u = f_j$ on the side j ($j = 1, 2, 3$), is analyzed. Here, ∂_τ and ∂_n are the tangential and normal derivatives, U_j are order-$2m_j$ differential operators with constant coefficients which have terms of even order only, μ_j are constants, and f_j are given functions. The problem reduces to two scalar Riemann-Hilbert problems which admit closed form solutions. The particular case when $U_j(s)$ are constants is analyzed in detail. In this case, the representation formulas for the solution are reducible to the ones obtained by the finite integral transformation and solution of the associated Sturm-Liouville problem. Both methods ultimately require determining roots of the same transcendental equation. These are found by quadratures on applying the Burniston-Siewert method and solving a certain Riemann-Hilbert problem on two segments. (Received September 22, 2015)