1056-76-338 **Anna Zemlyanova*** (azem@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803, and **Yuri Antipov**. *Application of the Riemann-Hilbert technique to a problem of a supercavitating wedge.*

Cavitation is an important aspect to consider for many industrial applications. However, the resulting mathematical problems present significant difficulties even in the two-dimensional ideal fluid case. In this talk we apply the methods of conformal mapping and Riemann-Hilbert problems on a Riemann surface to obtain a closed form solution of a problem for a non-symmetrical supercavitating wedge under free surface. The problem is reduced to a system of non-linear transcendental algebraic equations. Newton's method is employed for the solution of the system. The numerical results are presented. (Received August 30, 2009)