

Meeting: 1006, Lubbock, Texas, SS 5A, Special Session on Recent Advances in Complex Function Theory

1006-30-222 **Alexander Yu. Solynin*** (solynin@math.ttu.edu), Department of Mathematics and Statistics,
Texas Tech University, Box 41042, Lubbock, TX 79409. *Overdetermined boundary value problems
and applications.*

This is a joint work with D. Khavinson and D. Vassilev. We will discuss an overdetermined problem in planar multiply connected domains Ω . This problem is solvable in Ω if and only if Ω is a quadrature domain carrying a solid-contour quadrature identity for analytic functions. The problem can be reformulated as a problem about existence of special quadratic differentials. We give a complete solution of the problem in some special cases and discuss some applications concerning the shape of electrified droplets and small air bubbles in a fluid flow. (Received February 15, 2005)