1053-03-37 **Valentin V Andreev**, **Dale Daniel** and **Timothy H McNicholl***
(timothy.h.mcnicholl@gmail.com), Department of Mathematics, Lamar University, Beaumont, TX 77710. *Computing conformal maps onto circular domains.*

A *domain* is an open connected subset of the extended complex plane $\hat{C}$. A domain is *n-connected* if its complement has exactly n components. If one of these components consists of a single point, the domain is *degenerate*. The Riemann Mapping Theorem states that every non-degenerate 1-connected domain is conformally equivalent to the disk thus making the disk the *canonical domain* for the class of 1-connected domains. Bishop and Bridges's book contains a constructive proof of the Riemann Mapping Theorem. For domains of connectivity greater than 1, there are several canonical domains. These can be partitioned into the circular domains, the slit domains, and the polygonal domains. We are not aware of any constructive existence proofs for these mappings. We have however demonstrated the uniform computability of the conformal maps onto the circular domains. A partial result on this problem was presented at CCA 2008. We will discuss the techniques and ideas in the full solution including recent results on the computation of capacity of planar regions by Ransford and Rostand. We have also demonstrated the uniform computability of the conformal maps onto the slit domains. (Received July 10, 2009)