Exterior Monge Ampere Solutions

Daniel Burns
University of Michigan

We discuss the Siciak-Zaharjuta extremal function of a real convex body in C^n, a solution of the homogeneous complex Monge Ampere equation on the exterior of the convex body. We show the conditions under which a foliation by holomorphic curves can be found in the complement of the convex body along which the extremal function is harmonic. We also discuss the regularity of the solution. These results are derived by consideration of a variational problem for holomorphic disks in projective space passing through prescribed points at infinity. The extremal curves are all complex quadric curves, and the geometry of such curves allows for the determination of foliation and regularity properties. As a byproduct we encounter a new invariany of such a domain, the Robin indicatrix which is, in some cases, a strict dual of the Kobayashi indicatrix for a bounded domain. This builds on earlier work of Lempert, Lundin and Baran. It is joint work with N. Levenberg and S. Ma'u.