CRISTIAN ENACHE, American University of the Middle East

Maximum and minimum principles for a class of Monge–Ampère equations, with applications to surfaces of constant Gauss curvature

In this talk we first deal with a general class of Monge-Ampère equations, including the constant Gauss curvature equation. Our first aim is to prove some maximum and minimum principles for suitable P-functions, in the sense of L.E. Payne. Then, these new principles are employed to solve a general class of overdetermined Monge-Ampère problems and to investigate two boundary value problems for the constant Gauss curvature equation. More precisely, when the constant Gauss curvature equation is subject to the homogeneous Dirichlet boundary condition, we prove several isoperimetric inequalities, while when it is subject to the contact angle boundary condition, some necessary conditions of solvability, involving the curvature of the boundary of the underlying domain and the given contact angle, are derived.

References:

[1] C. Enache, Maximum and minimum principles for a class of Monge-Ampere equations in the plane, with applications to surfaces of constant Gauss curvature, Communications on Pure and Applied Analysis, 13(3) (2014), 1347-1359.

[2] C. Enache, Maximum principles and isoperimetric inequalities for some Monge-Ampere type problems, Comptes Rendus de l'Académie des Sciences Paris Series I - Mathematics 352 (2014), 37-42.