

Overdetermined problems in annular domains

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Consider a function u , harmonic in a ring-shaped domain and taking two constant (distinct) values on the two connected components of the boundary. If we know in advance that one of the components is a sphere, and that u satisfies some *overdetermined* condition on the other one, can we conclude that u is radial?

This talk deals with this question for certain overdetermined conditions on the gradient of u , involving the distance from the origin as well as the principal curvatures of the boundary. Some results can be expected to ellipsoidal domains, as well as to quasilinear elliptic equations.