

SUMMARY OF PHD DISSERTATION

Thesis title: Some problems in pluripotential theory

Speciality: Mathematical Analysis

Speciality code: 9460102 (62 46 01 02)

PhD student: Đỗ Thái Dương

Supervisors:

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Training Institute: Institute of Mathematics, Vietnam Academy of Science and Technology

The aim of thesis:

The aim of this thesis is to study some specific problems in pluripotential theory and potential theory.

1. Determine whether we can conclude that two subharmonic functions which agree almost everywhere on a surface with respect to the surface measure must coincide everywhere on that surface?
2. Find conditions for measure such that the solution of the Dirichlet problem for the complex Monge-Ampère equation is continuous outside an analytic set but may not be continuous in the whole domain?
3. Find conditions for $\nu = -(-\log(|f_1|^{b_1} + \dots + |f_m|^{b_m}))^a$ belongs to domain of Monge-Ampère operator, where f_1, \dots, f_m are analytic functions.
4. Find necessary and sufficient conditions of the volume of the sublevel sets near certain boundary points of functions from the class F in strictly pseudoconvex domains.

The main results of the thesis include:

The thesis obtains the following results:

1. An extension of the mean value theorem, a comparison theorem for subharmonic functions and their other versions in terms of measure densities, a counterexample in the case of surfaces of co-dimension 2.
2. A sufficient condition which relaxes assumptions of a well-known result of Kołodziej to some technical assumptions.

3. A necessary and sufficient condition for a such that $v = -(-\log(|f_1|^{b_1} + \dots + |f_m|^{b_m}))^a$ belongs to domain of Monge-Ampère operator, where f_1, \dots, f_m are analytic functions.
4. An integral theorem for the class F.
5. An necessary condition for upper bound of the volume of the sublevel sets near certain boundary points of functions from the class F in strictly pseudoconvex domains, a necessary condition and a sufficient condition for membership of the class F when the domain is the unit ball.

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