

COMPLEX GEODESICS AND COMPLEX MONGE-AMPÈRE EQUATIONS WITH BOUNDARY SINGULARITIES

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ABSTRACT. This is a joint work with Xueping Wang from USTC. We study complex geodesics and complex Monge-Ampère equations on bounded strongly linearly convex domains in \mathbb{C}^n . More specifically, we prove the uniqueness of complex geodesics in such domains with prescribed boundary value and direction, when the boundaries of these domains have minimal regularity. The existence of such complex geodesics was proved by the first author in the 1990s, but the uniqueness was left open. Using this uniqueness result and a uniform $C^{1,1/2}$ -estimate of complex geodesics and their dual mappings, we solve a homogeneous complex Monge-Ampère equation with prescribed boundary singularity, which was first considered by Bracci-Patrizio-Trapani on bounded strongly convex domains in \mathbb{C}^n with smooth boundary in their two important papers. The fundamental solution of the homogeneous Monge-Ampère equation was considered in the early 80's in a fundamental paper of Lempert.