

UNIQUENESS RESULTS FOR THE CRITICAL CATENOID

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Keywords

minimal surface, Steklov eigenvalue problem, free boundary problem, critical catenoid, convex curves in a sphere

Abstract A free boundary minimal surface in the three-dimensional unit ball is a properly immersed minimal surface in the unit ball that meets the unit sphere orthogonally along the boundary of the surface. The topic was initiated by Nitsche in 1985, derived from studies by Gergonne, Schwarz, Courant, and Lewy. Basic examples are the equatorial disk and the critical catenoid. The equatorial disk is the only immersed free boundary minimal disk in the ball up to congruence. The critical catenoid is claimed to be the only embedded free boundary minimal annulus in the ball up to congruence. Recently, the problem has been attempted using a relationship with the Steklov eigenvalue problem. In this session, I will describe previous studies in this direction and explain my uniqueness results for the critical catenoid as the embedded free boundary minimal annuli in the ball under symmetry conditions on the boundaries.

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