TGTC 2020: TITLE AND ABSTRACT

Generalizing the Linearized Doubling Approach and New Minimal Surfaces and Self-Shrinkers via Doubling

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Abstract: I will discuss recent work (with N. Kapouleas) on generalizing the Linearized Doubling approach to apply (under reasonable assumptions) to doubling arbitrary closed minimal surfaces in arbitrary Riemannian three-manifolds without any symmetry requirements. More precisely, given a family of LD solutions on a closed minimal surfaces embedded in a Riemannian three-manifold, where an LD solution is a solution of the Jacobi equation with logarithmic singularities, we prove a general theorem which states that if the family satisfies certain conditions, then a new minimal surface can be constructed via doubling, with catenoidal bridges replacing the singularities of one of the LD solutions. The construction of the required LD solutions is currently only understood when the surface and ambient manifold possess O(2) symmetry and the number of bridges is chosen large enough along O(2) orbits. In this spirit, we use the theorem to construct new self-shrinkers of the mean curvature flow via doubling the spherical self-shrinker and new complete embedded minimal surfaces of finite total curvature in the Euclidean three-space via doubling the catenoid