

1009-53-72

Rob Kusner* (kusner@math.umass.edu), Geometry, Analysis, Numerics & Graphics: GANG,
Department of Mathematics, University of Massachusetts, Amherst, MA 01003. *Nondegeneracy for
CMC surfaces and regularity of the CMC classifying map.* Preliminary report.

Equilibrium fluid droplets or splashes are modeled by embedded constant mean curvature (CMC) surfaces. Their possible deformations comprise the CMC moduli space. If the Jacobi operator (Hessian of the Area functional) on a CMC surface Σ is nondegenerate, then a neighborhood of Σ in moduli space is a smooth manifold; moreover, such nondegenerate Σ can be used as building blocks for more complicated CMC surfaces. We prove that all triunduloids (CMC surfaces with 3 ends and genus 0) are nondegenerate, and that the CMC classifying map is a diffeomorphism from the moduli space of triunduloids to the space of spherical triangles (an open 3-ball). More generally, we show that a coplanar CMC surface Σ is nondegenerate if and only if the CMC classifying map is regular at Σ . [This is part of a joint project with Nick Korevaar, Jesse Ratzkin, John Sullivan and Karsten Grosse-Brauckmann.] (Received August 04, 2005)