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Equivariant bifurcation in 2 geometric variational PDEs

Abstract. I plan to describe how classic variational bifurcation techniques can be adapted to two important geometric variational problems on closed manifolds, namely, finding hypersurfaces of Constant Mean Curvature (CMC) and finding metrics of Constant Scalar Curvature on a given conformal class (Yamabe problem). Both of these problems correspond to solving a nonlinear elliptic PDE on a closed Riemannian manifold, however, our methods only involve the corresponding variational characterizations. Our main results give infinitely many bifurcations for certain families of highly symmetric solutions of these problems, in particular implying the existence of infinitely many new solutions with less symmetry. Concrete geometric examples will be given regarding homogeneous metrics on spheres and homogeneous CMC hypersurfaces in cohomogeneity one manifolds.