Length and volume in four-dimensional symplectic geometry

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Abstract

Symplectic capacities are measurements of symplectic size. They are often given as lengths of closed orbits of a certain canonical vector field, and so connect embedding problems in symplectic geometry with dynamics. I will start by introducing recent joint work showing how to recover the volume of a natural class of symplectic 4-manifolds from a family of symplectic capacities, called ECH capacities. I will then explain several applications of this formula to dynamics, for example to studying surface diffeomorphisms and generalizations of the three-dimensional Weinstein conjecture.