Big fiber theorems in contact geometry

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Assume that we have a closed symplectic manifold M and a smooth map $\pi : M \to \mathbb{R}^N$ whose components pairwise Poisson commute. A celebrated theorem of Entov and Polterovich is that π admits at least one fiber which is not displaceable from itself by a Hamiltionan diffeomorphism [1]. One can also prove that if L is a Floer theoretically essential Lagrangian inside M then L is not Hamiltonian displaceable from at least one of the fibers of π [2]. I will discuss analogs of these results in contact geometry. A well-known special case is the non-displaceability of an anti-diagonal (i.e. a Legendrian leaf) of the Clifford torus from the Clifford torus inside the standard contact $S^3 \subset \mathbb{C}^2$ by a contact isotopy that is equivariant with respect to the antipodal action [3].

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References

[1] M. Entov, & L. Polterovich, *Quasi-states and symplectic intersections.* Commentarii Mathematici Helvetici 81.1 (2006), 75-99.

[2] U. Varolgunes, *Mayer–Vietoris property for relative symplectic cohomology.* Geometry & Topology, 25-2 (2021), 547-642.

[3] A. B. Givental, *Nonlinear generalization of the Maslov index.* Theory of singularities and its applications, Adv. Soviet Math., AMS vol 1 (1990), 71-103.