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Symplectically knotted cubes

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While by a result of McDuff the space of symplectic embeddings of a closed 4-ball into an open 4-ball is connected,

the situation for embeddings of cubes $\boxtimes 4 = \boxtimes 2 \times \boxtimes 2$ is very different. For instance, for the open ball $\boxtimes 4$ of capacity 1, there exists an explicit decreasing sequence $\boxtimes 1, \boxtimes 2, \dots \rightarrow 1/3$ such that for $\boxtimes < \boxtimes 2$ there are at least \boxtimes symplectic embeddings of the closed cube $\boxtimes 4(\boxtimes)$ of capacity \boxtimes into $\boxtimes 4$ that are not isotopic. Furthermore, there are infinitely many non-isotopic symplectic embeddings of $\boxtimes 4(1/3)$ into $\boxtimes 4$.

A similar result holds for several other targets, like the open 4-cube, the complex projective plane, the product of two equal 2-spheres,

or a monotone product of such manifolds and any closed monotone toric symplectic manifold.

The proof uses exotic Lagrangian tori.

This is joint work with Joé Brendel and Grisha Mikhalkin.

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