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Unobstructed Lagrangian cobordism groups of surfaces

The Lagrangian cobordism groups of a symplectic manifold encode the relations between Lagrangian submanifolds given by suitable classes of Lagrangian cobordisms. Biran and Cornea showed that, in certain circumstances, there is a natural morphism from the Lagrangian cobordism group to the Grothendieck group of the derived Fukaya category of the manifold.

In this talk, we consider the case of a surface of genus $g \geq 2$. In the first part, we show how to extend the result of Biran and Cornea to a class of immersed cobordisms satisfying a non-obstruction assumption.

In the second part, we show that in this case the morphism from the cobordism group to $K_0(\mathrm{DFuk})$ is an isomorphism. The proof builds upon previous work of Perrier, and also relies on Abouzaid's computation of $K_0(\mathrm{DFuk})$ for higher genus surfaces. Our main contribution is the proof that a large class of surgery cobordisms are topologically unobstructed, in the sense that they do not bound non-trivial disks or teardrops.