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A holomorphic 0-surgery model with application to cylindrical contact homology

It is known that a contact structure on a closed 3-manifold M is supported by an open book representation of M. By applying 0-surgery to every connected component of of the binding one gets a new manifold M' which is a mapping torus of a closed surface. Both RxM and RxM' can be endowed with R-invariant symplectic structures as well as R-invariant compatible almost complex structures.

In this talk we give, in the complex plane, a simple holomorphic model of the 0-surgery. This model allows explicit relations between pseudoholomorphic curves in RxM and pseudoholomorphic curves in RxM'. As an application, we use it to compute the cylindrical contact homology of open books resulting from a positive Dehn twist on a torus with boundary. These are the first examples of cylindrical contact homology via open books with nontrivial monodromy.