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Katrin Wehrheim* (wehrheim@mit.edu), 77 Mass Ave, Cambridge, MA 02139. *How to construct topological invariants via decompositions and the symplectic category.*

A Lagrangian correspondence is a Lagrangian submanifold in the product of two symplectic manifolds. This generalizes the notion of a symplectomorphism and was introduced by Weinstein in an attempt to build a symplectic category. In joint work with Chris Woodward we define such a category in which all Lagrangian correspondences are composable morphisms. We extend it to a 2-category by extending Floer homology to cyclic sequences of Lagrangian correspondences. This is based on counts of 'holomorphic quilts' - a collection of holomorphic curves in different manifolds with 'seam values' in the Lagrangian correspondences. A fundamental isomorphism of Floer homologies ensures that our constructions are compatible with the geometric composition of Lagrangian correspondences. This provides a general prescription for constructing topological invariants by decomposition into simple pieces and a partial functor into the symplectic category (which need only be defined on simple pieces; with moves corresponding to geometric composition). (Received June 23, 2011)