

Holomorphic foliations and low-dimensional Symplectic Field Theory

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Abstract

Symplectic Field Theory defines invariants of contact manifolds by counting holomorphic curves in their “symplectizations” and related symplectic cobordisms. In the case of contact 3-manifolds (the lowest non-trivial dimension), one can define special versions of SFT that count only embedded curves, and in particular curves that come in non-intersecting families: these tend to form foliations transverse to the Reeb vector field, thus giving strong constraints on the Reeb dynamics. They also satisfy some remarkable compactness properties, which are as yet only partially understood. I will outline the basic theory of holomorphic foliations and explain some partial compactness results, suggesting that a theory based on counting such curves may miraculously avoid the transversality problems that cause such analytical headaches in more general SFT.