

The complexified orientation bundle on a moduli space of pseudoholomorphic disks

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Abstract:

Pseudoholomorphic disks, or disk instantons, are useful objects that probe the geometry of a symplectic manifold. Their data is encoded in the moduli spaces of pseudoholomorphic disks, which is known to be orientable when the disks have boundaries on a relatively spin Lagrangian submanifold. I investigate the condition when the complexified orientation bundle on the moduli space is trivial, because when it is, it contains many more nowhere vanishing sections than the orientation bundle, sometimes existing when the latter is nonexistent. Using an obstruction theory argument, I show that the complexified orientation bundle is trivial when the boundary of the pseudoholomorphic disks lie on a spin c Lagrangian submanifold. Moreover, the choice of spin- c structure determines the choice of nowhere vanishing section.