

Deformation theory of deformed Hermitian Yang-Mills connections and deformed Donaldson-Thomas connections

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Abstract: A deformed Hermitian Yang-Mills (dHYM) connection is a Hermitian connection of a Hermitian line bundle over a Kähler manifold, which is believed to correspond to a special Lagrangian submanifold via mirror symmetry. A deformed Donaldson-Thomas (dDT) connection is its analogue over a G_2 -manifold and is believed to correspond to a coassociative submanifold. It is well-known by McLean that the moduli spaces of special Lagrangian and coassociative submanifolds are finite dimensional smooth manifolds. It is natural to ask whether these connections inherit the same properties.

In this talk, we show that each of their deformations is controlled by a subcomplex of the "canonical complex", an elliptic complex introduced by Reyes Carrion. In the case of dHYM, the obstruction space always vanishes, and hence the moduli space is always a finite dimensional smooth manifold. This is joint work with Hikaru Yamamoto.