

GEOMETRY AND TOPOLOGY SEMINAR

Higgs moduli spaces and O'Grady examples

Emilio Franco

CMUP

Abstract. Kiem proved that the moduli space of $SL(2, \mathbb{C})$ -Higgs bundles over a smooth projective curve X admits a symplectic desingularization if and only if g(X) = 2. Based on work of Schedler and Bellamy, Tirelli reproduced this result to the case of $GL(2, \mathbb{C})$ -Higgs bundles, proving as well that no symplectic desingularization of $SL(n, \mathbb{C})$ and $GL(n, \mathbb{C})$ -Higgs bundles exists besides these two cases where (n, g) = (2, 2).

Using the normal cone degeneration, Donagi, Ein and Lazarsfeld provided a degeneration of the moduli space of sheaves on a K3 surface into the moduli space of $GL(n, \mathbb{C})$ -Higgs bundles of a curve X embedded in the K3. We generalize this construction to the case of a hyperelliptic curve inside its Jacobian, obtaining a degeneration of the moduli space of sheaves with fixed determinant and dual determinant to the moduli space of $SL(n, \mathbb{C})$ -Higgs bundles.

(On genus 2) we use these degenerations to obtain a degeneration of the symplectically desingularized $SL(2,\mathbb{C})$ and $GL(2,\mathbb{C})$ -Higgs moduli spaces into, respectively, O'Grady's 6-dimensional and 10-dimensional examples of irreducible holomorphic symplectic manifolds.



With the support of UID/MAT/00144/2013 $\,$