

Bogomolov-Tian-Todorov theorem for a non-Kahler holomorphically symplectic manifolds

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It is well-known that Bogomolov-Tian-Todorov unobstructed deformation theorem fails for compact non-Kahler Calabi-Yau manifolds (the first counterexamples were constructed by E. Ghys). However, so far we have no examples of obstructed deformations for simply connected non-Kahler holomorphically symplectic manifolds or 3-dimensional Calabi-Yau (it was conjectured that Bogomolov-Tian-Todorov holds for such manifolds).

Todorov conjectured that any simply connected holomorphically symplectic compact manifold is Kahler. This conjecture was disproven by Dan Guan who constructed a non-Kahler holomorphically symplectic manifold from a Hilbert scheme of a Kodaira-Thurston surface; a more accessible construction is due to Bogomolov. We prove Bogomolov-Tian-Todorov theorem for Bogomolov-Guan manifolds. This is a joint work with Nikon Kurnosov.