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Pluriclosed 3-folds with vanishing Bismut Ricci form

In this talk, we discuss complex 3-dimensional non-Kähler Bismut Ricci flat pluirclosed Hermitian manifolds (BHE) via their dimensional reduction to a special Kähler geometry in complex dimension 2. The reduced geometry satisfies a 6th order non-linear PDE which has infinite dimensional momentum map interpretation, similar to much-studied Kähler metrics of constant scalar curvature (cscK). We use this to associate to the reduced manifold or orbifold Mabuchi functional, as well as to obtain obstructions for the existence of solutions in terms of the automorphism group. Furthermore, we discuss explicit solutions of the PDE on orthotoric Kähler orbifold surfaces which construct some new BHE examples.