

Stability of nearly Kahler manifolds

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We study the Hitchin functionals whose critical points are nearly Kähler and nearly G2 structures. We focus on their gradient flow and Hessians' spectral decomposition for the usual indefinite inner products.

We introduce new generalizations of Hitchin's functionals and use them to define a stability index for nearly Kähler and nearly G2 structures in the Morse Witten sense.

We discuss the parallels with higher-dimensional gauge theory and highlight the significance of the spectral decomposition and stability index in studying conically singular and asymptotically conical G2 and Spin(7) manifolds.