

Heat Flow of Isometric G2-structures

SERGEY GRIGORIAN

University of Texas Rio Grande Valley, 1201 W University Drive, 78539 Edinburg, TX, USA

`sergey.grigorian@utrgv.edu`

Given a 7-dimensional compact Riemannian manifold (M, g) that admits G2-structure, all the G2-structures that are compatible with the metric g are parametrized by unit sections of an octonion bundle over M . We define a natural energy functional on unit octonion sections and consider its associated heat flow. The critical points of this functional and flow precisely correspond to G2-structures with divergence-free torsion. In this talk, we first derive estimates for derivatives of $V(t)$ along the flow and prove that the flow exists as long as the torsion remains bounded. We will also show a monotonicity formula and an epsilon-regularity result for this flow. Finally, we show that within a metric class of G2-structures that contains a torsion-free G2-structure, under certain conditions, the flow will converge to a torsion-free G2-structure.