

Laplacian Co-Flow of G_2 -structures.

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In this lecture we consider the Laplacian "co-flow" of G_2 -structures, by which we mean, the Laplacian flow of the closed dual 4-form $\psi = *\varphi$ of the G_2 -structure,

$$\frac{\partial \psi_t}{\partial t} = -\Delta_{d_t} \psi_t, \quad d\psi_t = 0, \quad \psi(0) = \psi. \quad (1)$$

If is assumed short-time existence and uniqueness, then this flow preserves the coclosed ($d\psi = 0$) condition. This flow was studied in [1] for two explicit examples of coclosed G_2 -structures with symmetry, namely for warped products of an interval, or a circle, with a compact 6-manifold N which is taken to be either a nearly Kähler or a Calabi-Yau manifold and recently, in [2] for the 7-dimensional Heisenberg group.

The aim of this talk is to present several examples for the solution of (1), specially, we find a solution for the Laplacian coflow in a 7-dimensional nilpotent Lie algebra endowed with a left-invariant coclosed G_2 -structure, to make this, we follow the ideas explained in [3] and [4].

Referências

- [1] Karigiannis, S., McKay, B., and Tsui, M. P. (2012). Soliton solutions for the Laplacian co-flow of some G_2 -structures with symmetry. *Differential Geometry and its Applications*, 30(4), 318-333.
- [2] Bagaglini, L., Fernández, M., and Fino, A. (2017). Laplacian coflow on the 7-dimensional Heisenberg group. arXiv preprint arXiv:1704.00295.
- [3] Manero, V. (2015). Construction of Lie algebras with special G_2 -structures. arXiv preprint arXiv:1507.07352.
- [4] Lauret, J. (2015). Geometric flows and their solitons on homogeneous spaces. arXiv preprint arXiv:1507.08163.