

Closed warped G_2 -structures evolving under the Laplacian flow

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Abstract. We study the behaviour of the Laplacian flow evolving closed G_2 -structures on warped products of the form $M^6 \times \mathbb{S}^1$, where the base M^6 is a compact 6-manifold endowed with an $SU(3)$ -structure. In the general case, we reinterpret the flow as a set of evolution equations on M^6 for the differential forms defining the $SU(3)$ -structure and the warping function. When the latter is constant, we find sufficient conditions for the existence of solutions of the corresponding coupled flow. This provides a method to construct immortal solutions of the Laplacian flow on the product manifolds $M^6 \times \mathbb{S}^1$. The application of our results to explicit cases allows us to obtain new examples of expanding Laplacian solitons.

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