Research

Geometry Seminar

Geometry of Schouten Solitons

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Abstract.

Bourguignon introduced in [2] the problem of investigating certain geometric flows, each of which known nowadays as Ricci-Bourguignon flow. He proved results about these flows suggesting, according to him, that varying the metric in these particular ways would improve the curvatures of the initial metric.

It turns out that these flows may have the so called soliton solutions, which would not improve the curvatures, or any other geometric properties. Therefore, the investigation of these special solutions are an important step in the understanding of the flows introduced by Bourguignon. Several results about such solutions were proved by Catino and Mazzieri in [3].

In this talk, after a quick overview on the general theory constructed in [3], we focus on investigating the Schouten solitons. These are the soliton solutions of the Schouten flow, which is a Ricci-Bourguignon flow. We investigate a certain ordinary differential inequality on these manifolds and describe the behavior of its solutions, from where we obtain various optimal bounds. We use these bounds to prove results concerning the geometry of Schouten solitons, such as volume growth estimates of geodesic balls. The proof of these results can be found in [1].

References

[1] Borges, V. *On complete gradient Schouten solitons*. arXiv preprint arXiv:2102.05605 (2021).

[2] Bourguignon, J. P. *Ricci curvature and Einstein metrics*. Global differential geometry and global analysis. Springer, Berlin, Heidelberg, 42-63 (1981).

[3] Catino, G., Mazzieri, L. *Gradient Einstein solitons*. Nonlinear Analysis 132, 66-94 (2016).