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Examples of Ricci Solitons

A Ricci soliton is a “trivial” solution of Hamilton’s Ricci flow, i.e., a solution obtained by a one-parameter family of diffeomorphisms and dilations. Alternatively, a Ricci soliton is a pair (g, X) consisting of a complete Riemannian metric on a manifold M and a vector field X which satisfy the equation

$$\text{Ric}(g) + \frac{1}{2}\mathcal{L}_X g + \epsilon/2g = 0$$

where \mathcal{L} denotes the Lie derivative and ϵ is a constant. A Ricci soliton is *gradient* if the vector field X is the gradient of a function f . Ricci solitons are clearly generalizations of Einstein metrics. Furthermore, they arise when one considers blow-up limits of the Ricci flow as well as when one considers monotonic quantities along the Ricci flow.

In this talk I will discuss some recent examples of gradient Ricci solitons which were obtained in joint work with Andrew Dancer (Oxford).