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William Wylie* (wwylie@syr.edu), Mathematics Department, Syracuse University, 215
Carnegie Building, Syracuse, NY 13244. *Conformal Diffeomorphisms of Gradient Ricci solitons.*

It is well known that conformal changes do not preserve the Einstein condition. In fact, it is quite rigid when two Einstein metrics are conformal, and in the 1920s Brinkmann classified when this is possible. Yano-Nagano later showed that the only complete Einstein metric to admit a complete non-homothetic conformal field is the round sphere.

We extend these results to gradient Ricci solitons. In order to do so, we make the additional assumption that the conformal diffeomorphisms preserve the potential function (this assumption is always satisfied in the Einstein case as the potential function is constant). We show that the only non-homothetic conformal diffeomorphisms that preserve the potential function between complete shrinking or steady gradient Ricci solitons are the conformal transformations of the sphere and stereographic projection. We also show a complete gradient Ricci soliton admits a complete non-homothetic conformal field preserving the potential function if and only if it is the round sphere. These results are special cases of more general results for generalized quasi-Einstein metrics which will also be discussed.

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